RECEIVED
MAY 2 4 1937
U. of R. Library

Vol. 14, No. 5 MAY, 1937

The AMERICAN JOURNAL of OPTOMETRY

EDITORS

CAREL C. KOCH JACK I. KURTZ

COLLABORATORS

EARL ALLGAIER, *Ames, Iowa*
J. FRED ANDREAE, *Baltimore, Md.*
J. O. BAXTER, JR., *Fayetteville, N. C.*
J. O. BAXTER, SR., *New Bern, N. C.*
L. L. BEACHER, *New York, N. Y.*
ROBERT J. BEITEL, JR., *Southbridge, Mass.*
ROBT. T. BEST, *Fairmont, Minn.*
W. I. BROWN, *New Bedford, Mass.*
J. T. CAMPBELL, *Washington, N. C.*
BRANT CLARK, *San Jose, Calif.*
J. ROBINSON COHEN, *New York, N. Y.*
PAUL DILL, *Greeley, Colo.*
HOWARD C. DOANE, *Boston, Mass.*
J. H. DRAKEFORD, *New York, N. Y.*
G. L. DUPLESSIS, *Minneapolis, Minn.*
ISRAEL DVORINE, *Baltimore, Md.*
T. H. EAMES, *West Somerville, Mass.*
WM. FEINBLOOM, *New York, N. Y.*
L. P. FOLSOM, *South Royalton, Vt.*
HARRY LEE FORDING, *Portland, Ore.*
W. H. GLAZER, *Philadelphia, Pa.*
R. M. HALL, *Cleveland, Ohio*
C. J. HATHAWAY, *Pontiac, Mich.*
C. K. HAYNES, *Jamestown, N. Y.*
NORMAN B. HAYS, *Niagara Falls, N. Y.*
W. JEROME HEATHER, *Chicago, Ill.*
WM. HENNING, *Fargo, No. Dak.*
ARTHUR E. HOARE, *Los Angeles, Cal.*
H. S. HORTON, *Cleveland, Ohio*
E. E. HOTALING, *New York, N. Y.*
J. F. HURWITZ, *New York, N. Y.*
E. A. HUTCHINSON, *Los Angeles, Cal.*
CHARLES E. JAECKLE, *Newark, N. J.*
H. D. JUDD, *Detroit, Mich.*
BESSIE E. KEHL, *St. Louis, Mo.*
L. H. KRASKIN, *Washington, D. C.*
ALVHH H. LAUER, *Ames, Iowa*
C. V. LYONS, *San Francisco, Calif.*
G. A. MACELREE, JR., *Philadelphia, Pa.*
F. L. MASON, *Berkley, Calif.*
D. J. MAYER, *Riverside, Calif.*
O. L. MCCULLOCH, *Holyoke, Mass.*
F. MCFADDEN, *Rutland, Vt.*
O. J. MELVIN, *Omaha, Nebr.*
WILLIAM B. NEEDLES, *Chicago, Ill.*
JOHN C. NEILL, *Philadelphia, Pa.*
J. F. NEUMUELLER, *Woodbury Heights, N. J.*
G. O. OHLSSON, *Detroit, Mich.*
C. R. PADELFORD, *Fall River, Mass.*
D. R. PAINE, *Topeka, Kansas*
GEO. A. PARKINS, *Ord, Nebr.*
R. J. PEARCE, *Greensboro, N. C.*
RAY MORSE-PECKHAM, *Detroit, Mich.*
ERNEST PETRY, *Rochester, N. Y.*
HARRY E. PINE, *Chicago, Ill.*
S. M. ROBINSON, *Prescott, Ariz.*
E. LEROY RYER, *New York, N. Y.*
H. LESLIE SALOV, *Newark, N. J.*
Z. J. SCHOEN, *University, Virginia*
CHARLES SHEARD, *Rochester, Minn.*
CARL SHEPHARD, *Chicago, Ill.*
R. E. SIMPSON, *Pasadena, Calif.*
WILLIAM SMITH, *Roxbury, Mass.*
H. RILEY SPITLER, *Eaton, Ohio*
M. STEINFELD, *Paducah, Ky.*
EDWIN F. TAIT, *Philadelphia, Pa.*
WILLIAM J. TAIT, *Philadelphia, Pa.*
S. S. TITUS, *Kansas City, Mo.*
W. O. VIVIAN, *Media, Pa.*
R. N. WALKER, *Winston-Salem, N. C.*
A. D. WHEELOCK, *Des Moines, Iowa*
A. WHITAKER, JR., *Bridgetown, N. J.*
E. G. WISEMAN, *Buffalo, N. Y.*
ARENE T. WRAY, *Los Angeles, Calif.*
LLOYD K. WYATT, *Peoria, Ill.*
N. A. ZEVIN, *Philadelphia, Pa.*

QP
474
A512

Published Monthly by the AMERICAN JOURNAL OF OPTOMETRY PUBLISHING ASSOCIATION,
1501 Foshay Tower, 821 Marquette Ave., Minneapolis, Minn.

ANNUAL SUBSCRIPTION $4.00. CANADA $4.50, FOREIGN $5.00
Single copies, 50c.

Entered as second-class matter February 20, 1924, at the postoffice at Minneapolis, Minnesota.
under the Act of March 3, 1879.

Three cardinal points in Benson Prescription Service:

1. Accurate Interpretation
2. Careful Styling
3. Individuality

N. P. BENSON OPTICAL CO., INC.

"Established 1913"

Main Office: MINNEAPOLIS, MINN.

— Branches —

ABERDEEN
BISMARCK
DULUTH
EAU CLAIRE
LA CROSSE
WAUSAU
RAPID CITY
STEVENS POINT
ALBERT LEA

THE PRINCIPLES and PRACTICE
of
OCULAR PHYSICAL THERAPY
for
OPTOMETRISTS
by
DR. JACK I. KURTZ

What others Say about The Book

You are to be congratulated upon the conservative manner of presenting the subject, and if the members of your profession will follow your advice in reference to becoming thoroughly familiar with the fundamental principles governing the use of the different agencies, the book will prove of inestimable value.
B. B. Grover, M.D., editor, author and lecturer,
Colorado Springs, Colo.

This book is sent on approval to ethical optometrists.

APPROVAL BLANK—Clip and mail today.

.....

American Journal of Optometry.
1502-4 Foshay Tower, Minneapolis, Minn.

Kindly send me on approval a copy of "The Principles and Practice of Ocular Physical Therapy for Optometrists" by Dr. J. I. Kurtz. If after reading it I do not find anything of value to me I will return it in five days and you will refund me all I have paid for it.

☐ Send book postage prepaid. I enclose my check for $4.50.
☐ I will pay the postman $4.50, plus a few cents postage.

Name..... Street.....
(Print or write plainly)

City and State.....

The right is reserved to reject any order or orders for this volume.

QP
474
A512
v. 14, no. 5

AMERICAN JOURNAL OF OPTOMETRY

Vol. 14 MAY 1937 No. 5

CONTENTS

ORIGINAL PAPERS

Eye Conditions Produced by Common Diseases. Thomas Harrison Eames 162

EDITORIALS

Suggested Ocular Tests to be Made in Visual Survey Work, and Recommended Examination Routines for Various Visual Survey Purposes. Carel C. Koch 168

SPECIAL REPORTS

The Character of the Optometric Practitioner. Laurence P. Folsom 193

BOOK NOTICES

The Ocular Fundus in Diagnosis and Treatment. Donald T. Atkinson 200

Lectures Delivered at the Detroit Congress of the American Optometric Association, 1936. E. Kiekenapp, Editor . . 200

ABSTRACT

Apparent Increase of Hyperopia up to the Age of Nine Years. E. V. L. Brown 201

LET THESE NEW

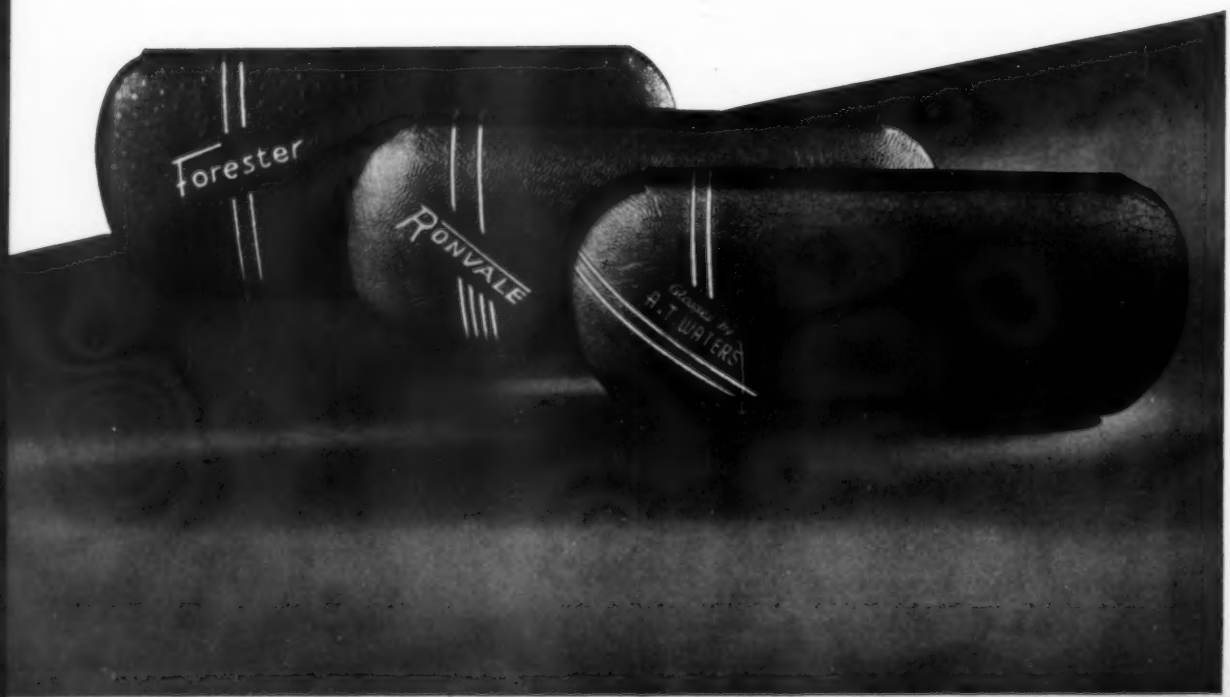
"Personalized"

CASES BUILD

Six sparkling new cases . . . styled in the modern manner . . . permanently imprinted with your name or initials . . . cases that bear witness to the quality of your service wherever your patient's glasses go.

Five of these designs - the five carrying the full name - are available in leatherlike covered steel or aluminum while the light-weight alumi-leather case

American



GOOD WILL FOR YOU

has a genuine leather inlay which may be had in "J", Patent Calf or Florentine coverings. This case is also made to accommodate the longer Ramsey endpieces.

When the examination is over . . . and the glasses are ready for your patient . . . there's no finer gesture, no surer way to build prestige than to present the glasses in a case that's "exclusively yours.

Optical Company

Eighth Annual

PRACTIONEERS' CLINICAL AND EDUCATIONAL WEEK

June 6 - 11, 1937

THE PENNSYLVANIS STATE COLLEGE OF OPTOMETRY

Invites

all practing optometrists to attend these outstanding clinical and eduational courses, which is its annual contribution to the men in practice.

As usual, there is no charge for this week of educational work. In addition, a Certificate of attendance is awarded to all who attend.

Formal courses will be offered from 9-12 a. m. and from 1-2 p. m. daily, at the Main Building.

Clinical sessions will meet from 3-5 p. m. daily, at the College Clinics. Evenings will be reserved for symposia.

Write for particulars

THE PENNSYLVANIA STATE COLLEGE OF OPTOMETRY

PHILADELPHIA, PENN.

AMERICAN JOURNAL OF OPTOMETRY

Vol. 14 MAY, 1937 No. 5

EYE CONDITIONS PRODUCED BY COMMON DISEASES*

Thomas Harrison Eames, Opt.D., M.D.
West Somerville, Mass.

Many of the difficult or "Grief" cases encountered in optometric practice are those in which symptoms of eye strain are produced by morbid conditions remote from the eyes. A large number of diseases produce such symptoms but the optometrist's interest centers particularly about those in which the patient is up and about and comes in to secure relief from the ocular manifestations. Persons with chronic illnesses which do not greatly restrict daily routine are likely to fail to associate the eye condition with their general health and often omit or avoid telling the optometrist of their other ailment. The history should be taken carefully and fully in every case so as to bring out information about any co-existing disease.

Persons with upper respiratory infections popularly referred to as "common colds" and "grippe colds" are not infrequently encountered by optometrists. These conditions are usually productive of asthenopia and accommodative weakness and it is of these that the patient most often complains. The eyes are congested, lachrymation is common and photophobia is often present.

It is unwise to examine the eyes during the course of these infections because the findings are often not representative and a reading correction prescribed at a time when the accommodation is asthenic is likely to be too strong after recovery from the disease which produced the asthenia. In children and young adults a certain amount of latent hypermetropia becomes manifest temporarily during these illnesses and a correction secured during this period may give trouble when normal vigor is regained. The "common cold" and "grippe cold" are both very infectious and are spread by droplets scattered through the air in sneezing and coughing. Optometrists may protect their patients and themselves by deferring examination of persons ill with these conditions until after recovery has occurred. The patient should be advised to return if his eye symptoms persist after full recovery from the infection. True grippe or influenza is a general infection and the eye symptoms are frequently similar to

*Submitted for publication April 6, 1937.

those of the severer forms of the "common cold." Prostration is greater and the optometrist is most likely to see influenza patients during the period of convalescence, since the asthenopic symptoms tend to persist for several weeks following clinical recovery from the disease itself. Weak reading additions are sometimes helpful during this period but it is fully as effective to restrict use of the eyes for a week or two until the ciliary apparatus has regained its usual strength.

Dental disease is widely recognized as a cause of some of the cases of eye trouble. It is productive of congestion of the conjunctivae, sensitivity to light, watering eyes, and particularly accommodative insufficiency and asthenia. Occasionally inflammatory affections of the choroid, ciliary body, cornea, or iris may result. Diseases of the sinuses often produce headache which is aggravated by use of the eyes, especially in close work and reading. Accommodative asthenopia is common and the patient may believe his trouble to be wholly ocular. Infected tonsils act as foci from which toxins affect the system. Accommodation is often impaired, pain follows use of the eyes, and inflammation of the conjunctivae may occur. Middle ear disease and infection of the mastoid cells is productive of very similar ocular symptoms but these conditions are less often seen by the optometrist. Pain in the ear, discharge from it, or swelling behind or about it should be enough to warrant postponement of examination and reference to an otologist. In chronic sinusitis, which is often resistant to treatment, a temporary reading addition may give partial relief to the eyes. Troublesome teeth and tonsils are better out than in and the treatment of this underlying cause is all that is necessary for the eye trouble.

Diseased tonsils and adenoids in children are common causes of accommodative asthenia. The child may fail to interpret the discomfort but the inattention in school and disinclination to use the eyes in close work for more than short periods are suggestive. In the north-east many physicians defer operation for diseased tonsils and adenoids until warm weather and weak convex lenses for reading and close work have been tried temporarily between the times of diagnosis and operation. Reading glasses have not been uniformly satisfactory in this connection and it is probably as well to restrict the use of the eyes and to favor them as much as possible until operation is performed.

Gastro-intestinal affections frequently result in heterophoria and accommodative insufficiency with asthenia. Inflammatory conditions in the eyes have occurred from septic foci in the G.I. tract. Amblyopia may result, especially after hemorrhage which may be suspected in those who have ulcerative or neoplastic disease of the stomach or intestines. The effects of constipation and auto-intoxication are familiar and require little discussion. The dull headache, soreness in the eyes, difficulty in doing close work and general asthenopia are familiar. The treatment consists of regulation of habits of elimination. Optical aid is unnecessary.

Anaemia is often accompanied by asthenopic symptoms. Rapid fatigue of the eyes in close work, headache, dizziness, and sometimes fainting spells are not uncommon. Sometimes the visual acuity can not be raised to more than 20/30 or 20/30 plus. The skin is pale, the tarsal conjunctivae are pale pink, the sclerae are extremely white and the ophthalmoscope reveals pallor of the fundus and optic nerve head. Tortuosity of the retinal vessels may appear to be increased and retinal hemorrhages may occur. In pernicious anaemia the retinal hemorrhages are very frequent and retinitis is sometimes seen.

Dizziness and headache may occur in Leukemia. The ophthalmoscope may disclose the presence of retinitis and retinal hemorrhages in the fundi.

Cases of hypertension or high blood pressure are frequently met with in the offices of optometrists. They are so common that little need be said except that they are usually robust, energetic people who complain of headache or dizziness. The ophthalmoscope usually shows arterio-sclerotic changes in the vessels of the retina and sometimes retinal hemorrhages may be seen.

Hypotension sometimes gives rise to rapid fatigue of the eyes in close work and headache is not uncommon. The eye symptoms are often similar to those encountered in anaemia and after hemorrhage.

Several cases have come to my attention in which the chief complaint was of moderate asthenopia and in which the optometrical examination was negative. Careful physical examination disclosed nothing but adenitis. This was general in one case and more or less localized in the others. When the adenitis was treated improvement in the eye symptoms appared to parallel reduction in the size of the glands.

Disease of the liver may produce discomfort in the eyes and weakness of accommodation, making near work tiresome. The skin, sclerae, and conjunctivae are tinted when jaundice is present and the color ranges from lemon to a greenish bronze.

Diabetics usually experience some interference with vision and may find close work difficult, due to paresis of the accommodative muscles. Visual acuity often falls rapidly and does not respond to refractive correction. Hemorrhages, retinitis, and optic nerve atrophy are frequent and sooner or later diabetic cataract usually makes its appearance. Changes in refraction sometimes occur and are believed to bear some relation to the sugar level in the blood. In such cases changes in the refractive correction help the patient to see better temporarily and improve his morale.

Frontal headache is often very severe in Acromegaly, a dystrophy usually accompanying tumor of the pituitary gland. The pupils become sluggish, epiphora appears, and exophthamos may occur in the course of the disease. The ophthalmoscope shows the presence of atrophic changes. The coordination of the eyes may be impaired due to pressure on the

oculomotor and abducent nerves. The visual fields exhibit changes including bitemporal restriction or hemianopsia.

*Hypo*thyroid cases may consult the optometrist because of difficulty in reading and feeling of fatigue when doing close work. Examination may reveal swollen, puffy lids, amblyopia, and optic neuritis. *Hypo*thyroid children present the characteristic picture of cretinism and are not frequently brought to the optometrist but persons in whom *hypo*thyroid conditions have developed during adulthood may come in on account of interference with their work. In general such persons are somewhat slowed up both mentally and physically, the face is puffy, the skin is dry and the hair is brittle. They lack force and drive and may attribute their diminished energy to eye trouble. Such persons should be referred to the endocrinologist.

*Hyper*thyroidism produces disturbance of convergence and for this reason the patient may seek eye examination. The eyes tend to protrude and from this feature the name "Exophthalmic goitre" is derived. Vision is usually normal. The lids become retracted and the upper lid grows rigid and does not follow the lower in looking down. (Von Graefe's Sign.) Winking is less frequent than usual, (Stelwag's Sign) due to the involvement of the lids. The palpebral aperture is widened. Tremor of the lids is often observed. The patient is usually forceful and living at high nervous tension.

Patients with nephritis are likely to complain of headache. The migrane type is frequent, and a morning headache that persists until noon time is common. Close work is likely to result in headache suggestive of accommodative difficulties. Vision may be reduced and not improved by glasses. Marked visual disturbance may occur without changes in the fundi. The changes in the eye grounds do not appear until the disease is well advanced and their absence does *not* rule out renal disease. Among the more common retinal changes are flame shaped hemorrhages, arterio-sclerotic changes, diffuse retinitis, and involvement of the head of the optic nerve. Palpebral and conjunctival hemorrhages are often seen. The eye lids are puffy and oedematous in the chronic parenchymatous form of nephritis.

Tertiary Syphilis often produces paresis of accommodation and the extraocular muscles. This stage of the disease is characterized by skin eruptions, bone and visceral lesions and amyloid degeneration. Patients are unlikely to admit having the disease and if it is suspected the wise course is to advise physical examination. In such cases orthoptics are not particularly helpful but convex lenses may be used as an aid in reading. Ocular paralyses may follow diphtheria. They most often appear during the second week of convalescence and are usually transient. The optometrist is not likely to encounter them but should keep them in mind.

Following most of the debilitating diseases and fevers asthenopic symptoms arising from accommodation and convergence insufficiencies

are likely to occur. The conditions result from the general debility produced by the disease. Paresis of the ocular muscles are common in such cases. Reading glasses are often helpful during this period and tend to promote the patient's comfort and ease in reading. Use of the eyes should not be excessive until normal vigor has been regained. The asthenopic symptoms may persist for weeks and sometimes months after the patient appears to be otherwise free from the disease and its effects. Orthoptics, if administered with caution, may promote recovery from the eye trouble but probably hygienic measures and promotion of the general health are equally beneficial.

Among the affections of the nervous system Tabes Dorsalis is prominent as a cause of eye trouble. The complaint is made to the optometrist that there is reduced visual acuity, or that close work is difficult and double vision has been observed. The pupils are small and may be unequal. The Argyll-Robertson pupillary reaction is present, Ptosis may occur and the ocular muscles may exhibit transient paralyses. Lowered vision is usually accompanied by atrophic changes.

Hysteria may present a wide variety of ocular symptoms such as monocular diplopia, scotomata, photophobia, spasm of the lids, concentric contraction of the fields, often to a very marked degree, and loss of vision. One or both eyes may be affected. After all physical factors have been ruled out the treatment is largely psychotherapy.

Neurasthenia may account for pains in and around the eyes. It is also productive of headache which is aggravated by close work. Whether or not glasses or other optical aid proves helpful depends on the individual. Sometimes correction of extremely slight refractive errors gives these patients marked relief.

Women in whom the menstrual function is relatively normal and who experience little or no discomfort during the menses often present themselves for eye examination during the monthly period, probably without thought of the effect of the physical condition on the eyes. There appears to be a tendency toward increased exophoria, weakness of the accommodation, and lowered muscular reserves during the period. Refractions performed during the menses may prove unrepresentative and glasses prescribed on the basis of these findings may be uncomfortable after the period is over. Less trouble arises from this source than from the treatment of muscular and fusional deficiencies indicated by testing during a period. These groups of conditions tend to be disturbed during the menses and are likely to be found much reduced or absent if the testing is repeated between periods. During the menses vicarious menstrual bleeding may occur beneath the conjunctivae, in the vitreous humor and in the retina.

At the menopause the patient has entered the presbyopic period and may exhibit apparent need for much stronger reading additions than are to be expected for the patient's age. This is due to accommodative insuf-

ficiency which is usually transient. Muscular imbalances, especially exophoria, may occur and asthenopic symptoms are common.

Pregnancy brings about profound changes in the maternal organism and headache, heterophorias (especially exophoria) accommodative weakness, and asthenopia are often experienced. During the early months, before the bodily contour reveals the maternal condition, the woman may have difficulty in reading or sewing and may consult the optometrist. Many women try to conceal their condition as long as possible but the optometrist should not hesitate to make inquiry about it, especially if he contemplates the use of orthoptic treatment. Convex lenses for reading and close work are often helpful but orthoptics are without much value. In the later months of pregnancy a woman complaining of severe headache (usually frontal) with or without visual disturbance or pupillary changes should be advised to consult her physician immediately and eye examination should be deferred.

During the period of lactation asthenopic symptoms may occur. Paresis of accommodation sometimes interferes with the patient's reading, sewing, and close work. Although the condition is usually transient, temporary reading glasses may be helpful.

DR. THOS. H. EAMES
31 CHESTER ST.
WEST SOMERVILLE, MASS.

AMERICAN JOURNAL OF OPTOMETRY

Vol. 14 MAY, 1937 No. 5

EDITORS

DR. CAREL C. KOCH
1501 Foshay Tower
821 Marquette Avenue
Minneapolis, Minn.

DR. JACK I. KURTZ
1501 Foshay Tower
821 Marquette Avenue
Minneapolis, Minn.

Original papers, scientific communications, clinical reports, society proceedings, books for review, and correspondence should be sent to the Editor, Dr. Carel C. Koch.

Annual Subscription, $4.00 in Advance; Canada $4.50, Foreign $5.00.
Single Copies, 50c.

Copy of advertisements must be sent in by the tenth of the month preceding their appearance. Subscriptions, applications for single copies, communications with reference to advertising or other business should be addressed to the Business Manager, Dr. Jack I. Kurtz, 1501 Foshay Tower, Minneapolis, Minn.

Published Monthly by the
American Journal of Optometry Publishing Association.

The Journal has no objection to the reprinting by other magazines of any of its articles, provided such reprints are properly credited to the American Journal of Optometry.

SUGGESTED OCULAR TESTS TO BE MADE IN VISUAL SURVEY WORK, AND RECOMMENDED EXAMINATION ROUTINES FOR VARIOUS VISUAL SURVEY PURPOSES

A short time ago the writer[1] presented certain material which indicated that a somewhat large percentage of the general public were doing their daily tasks with vision that was, in some degree at least, subnormal. The study referred to had to do with the distribution of cases with subnormal visual acuity and mentioned several visual surveys which had been made, in which the total number of subjects whose vision was subnormal varied from 15 per cent to nearly 50 per cent. The fact, which was developed then, was that too many of our citizens had subnormal vision, but another matter also became evident as that study was made, and this was the fact that each survey studied, was conducted in a different manner and each had therefore, a result which was difficult to compare with that of any other survey. Because of this fact, and to attempt a start, in the task of standardizing this type of ocular survey work the writer has made the following study of much of the literature of this subject to get as many suggestions as possible from previous workers in this field and then to appraise these suggestions in the light of

present experience. The writer will then suggest a standard examination routine for visual surveys, which when followed, would lead to uniform results. These in turn would lead to statistical studies which would have real value and which would enable us as optometrists to advise health authorities in matters relevant to ocular and visual care.

A study of visual survey work is logically divided into the four divisions, in which large segments of the public are found, and in which many can be either directed or induced to have their vision tested. These four divisions in which many ocular surveys have been made are: first, Industry; second, Schools; third, Motor Car Drivers and fourth, General Surveys such as can be made in places where large numbers of persons gather. Industrial surveys and School surveys are made with the purpose in mind of improving the efficiency of either the workers or the students. Motor Car Driver surveys are made in the interest of public safety while the General Surveys can be made on the basis of giving to the applicant health information about himself or herself which would be, and is, of value to the subject or applicant. It therefore is obvious that as a public health measure these visual surveys have merit, and therefore they become a vital part of the activity of every local optometric organization. The work is so important, and if carried on properly by optometrists will do so much, to advance the professional status of the members of the optometric profession, that the American Optometric Association should devote a considerable portion of its activities towards directing and assisting local societies in their efforts in this field.

The work is such as to require the attention of a number of optometrists, working as a unit, or a team, and therefore it obviously becomes an organiaztion problem, rather than an individual one. In fact, as an organization, visual surveys can be conducted entirely without the stigma of personal advantage or gain being advanced, and thus will be accepted by the people as a public health measure, which they are, rather than an event used to advertise some specific individual. The writer can think of no one measure, which if put into general use, will do as much to rouse public interest in the advancement of optometry as the wide and general use of the free Eye Survey Clinic in which nothing is sold, and only information of value is given to those individuals who present themselves for the survey.

The work can be done by any optometric society having twelve to fifteen members. The cost is relatively small and the time spent by each individual member in working at the clinic or on the survey is nothing when compared to the favorable effect this type of professional work has upon the public so reached. Each group effected by such an effort has much to gain. The optometrists so engaged will find the work both stimulating and educational and the public so reached, be they children, or workers in industry, or members of families as they attend county fairs will benefit as they are given direct factual information of value to

them, about their vision, and at the same time can be given some general counsel on the future care of their eyes.

Visual Survey Work in Industry

Industrial eye surveys can be correctly made in one of two ways. Either by an optometrist or an ophthalmologist engaged for this purpose by the firm to make the survey, or by an optometric society working as a unit; thus making the survey in the interests of the health of the workers.

A report of the New England Conference of Industrial Physicians[24] discusses the relative value of ocular examinations of industrial employees by oculists and optometrists respectively. The report recommends that industrial establishments should either (1) employ an ophthalmologist for all eye service, (2) employ an ophthalmologist who will do all or part of the refraction work or who will be available for consultation by an optometrist so employed, or (3) employ an optometrist who will act under medical supervision; these alternatives being presented in the order of their value.

The writer strongly deplores the practice of permitting individual optometrists to enter industrial plants and survey the vision of the workers with the added privilege of "selling" glasses to those workers who can be high-pressured into buying them. This type of thing has done much to bring the entire matter of industrial eye surveys into disrepute, and has also done much to create the impression that optometrists are only interested in the "sale" of optical material. Examinations conducted in this manner are not ocular surveys at all, but are merely attempts to coerce employees into buying something for which they frequently have no use, because they fear that should they refuse, they might lose their jobs. The entire practice is unethical and harmful and should be discouraged by optometric organizations wherever engaged in.

Ocular surveys which have as their single purpose the matter of improving the visual efficiency of the workers should therefore be made by either an optometrist or an ophthalmologist engaged by the firm for this purpose, or by an optometric society who will do the work purely in the interest of public health, without engaging in the actual prescribing of material. A survey of this latter type would merely advise those workers of any abnormality present and instruct them to seek the services of their own oculist or optometrist to have this corrected.

In making a visual survey of industrial workers it is necessary to make certain tests other than the mere recording of the worker's visual acuity, although by that test alone, many would be found to be subnormal. Silver[25] reviews the work done in this field and concludes that at least 50 per cent of all workers in industry have subnormal visual acuity. Dublin[12] suggests the following minimum visual survey routine for use in industrial plants. (1) *Ophthalmoscopy.* (2) *Static Skiametry.* (3) *Dynamic Skiametry.* (4) *Near-point Accommodative tests,* and (5)

Tonicity tests. He also feels, however,[19] that if the survey is to fulfill everything that it should, that all eight of the following tests be made and their findings recorded and analyzed. (1) The percentage of *Visual Acuity.* (2) The approximate amount and kind of *Ametropia.* (3) *Color Perception.* (4) The kind and amount of corneal *Astigmatism.* (5) The *Pupillary Action* in response to both light and accommodation. (6) The *Tonicity* of the extrinsic ocular muscles. (7) The *Near-point of Accommodation* and *Convergence.* (8) The absence of *Pathology.* After all of the employees have taken these tests Dublin then suggests a complete refraction for those whose survey findings indicate that additional ocular work must be done. Ginestous[36] points out the inadequacy and utter lack of uniformity in the eye examinations of railway employees conducted by various French railway companies and suggests standard methods embracing: (1) *Central Visual Acuity tests* including (a) speed of vision, and (b) acuity under variations in lighting. (2) *Color Vision.* (3) *Visual Field tests,* and (4) tests for *Binocular Vision.*

So much for a brief review of the work done in the field of eye surveys in industry. It is obvious that here each survey might differ slightly from another inasmuch as factors of importance in one industrial plant might not apply with such force to the workers in another, yet the tests which are made, in each instance, should be conducted in such a standard manner, that results would be comparable. Before making specific recommendations for future survey work to be done in industry we will consider some of the work of this kind already done in the schools.

Visual Survey Work in Schools

Up to and including the present time, most of the visual survey work done among students has consisted of the reading of Snellen Test Types placed at 20 feet from the student. This test is wholly inadequate as it ignores so many vital factors of ocular comfort and ocular well being. To be sure, it is better than no visual test at all, inasmuch as it does weed out those whose visual problems are such as to prevent them from having normal vision, but it fails in so many particulars as to make it essential that we as eye specialists give serious thought to the improvement of this type of school hygiene work. This is said with no intention of criticizing public school officials who are doing their best to give the student the very finest care possible. The fact remains that at the moment there are not enough optometrists and ophthalmologists in the entire country to do the school eye examining work which should be done, if they all devoted their entire energies to this problem and did nothing else. For this reason Petry[21] suggests the training of a special corps of young women who will devote all of their time to the important work of making school visual surveys and supervising the ocular problems of school children. These young women to be trained as are dental assistants, by our colleges. They would serve in various ways as opto-

metric prophylactic assistants and could thoroughly survey the eyes of all students, referring to optometrists or ophthalmologists those needing additional visual care. However, until such time as this type of capable assistance is provided, local optometric societies can do much good by working collectively on this problem.

Cox[23] suggests the formation of an optometric team to conduct visual surveys in schools. Each team would be composed of seven optometrists, and when working properly, such a group, Cox claims, can successfully conduct a visual survey on at least fifty school children each hour. This survey would be conducted as in the following manner. Each child is given a square of fibre board on which is clamped the survey record blank in duplicate. The child carries this throughout the visual survey and the findings of each optometrist are noted thereon. The school nurse distributes these and takes care of bringing the children from class as they are needed. Any class room or even a corridor can be used for this work. The optometrists are arranged around the room in the sequence of their operation so that the student can pass from one to the other without confusion. The following tests are suggested by Cox. (1) *Visual Acuity.* It is suggested by Cox that this be taken first, both to prevent the child from memorizing the letters while waiting and to eliminate any slight fatigue which the survey might cause. This is the only phase of the survey routine which is subjective. (2) *Versions.* (3) *Near-point of Convergence.* The first optometrist of the visual survey team devotes his entire time to a taking and recording of the visual acuity. The second optometrist takes the versions and the near-point of convergence. The third optometrist makes the next two tests. (4) *Cover test,* and (5) *Near-point of accommodation.* The sixth test employed by this survey team takes the entire time of two men. This test is (6) *Dynamic Skiametry.* This skiametric work, carried on by the fourth and fifth optometrists of the team, is all done using the dynamic techniques, the error of refraction being classified (a) hyperopia of more or less than one diopter, and (b) myopia of more or less than one-half diopter. The next test is that of (7) *Ophthalmoscopy,* this taking the full time of the sixth optometrist. The final step in the survey routine is that of (8) *Symptoms.* The seventh optometrist makes note of any objective or subjective symptoms as well as reviewing the findings of the previous examiners. His work is to sum up the case and make whatever suggestions are necessary to the school nurse and through her, to the parents. This type of a visual survey team has done some very fine work in and around Rochester, New York.

Petry[9] who has had considerable experience in the field of school survey work and who had a large part in the formation of the first optometric eye survey team, suggests the following routine as basic, in this type of ocular work. (1) Students, Name, Age and Symptoms taken by nurse outside of the survey room. (2) Pupil steps inside of the room, then toes a certain mark on the floor and monocularly reads letters on a chart placed at 6 meters. The findings of this *Monocular Visual*

Acuity Test are then noted on the record chart. (3) *Dynamic Skiametric examination* will next reveal whether error of refraction is high or low. (4) *Ophthalmoscopic examination* will reveal positive or negative contributing symptoms and incidentally provides an opportunity for external examination as well. (5) Next are made the *Version and Visual Axis tests*. These are made by causing the eyes to vert in the cardinal directions and the limitations and co-ordinations are noted. (6) The *Pupillary reaction test* is then made for both light and accommodation. (7) *Near-point of Accommodation* test is then made to reveal premature presbyopia, with a near-point of six inches to be regarded as a tolerance limit. (8) *Near-point of Convergence test* is then made to reveal whether convergence can be maintained up to and beyond the six inch limit. (9) *Summarizing* and *Classifying* record charts. Petry[33] also reports as Chairman of a committee to study the matter of visual surveys in the schools of New York and here suggests the following minimum of tests to be made in doing this survey work. (1) *Skiametry*. (2) *Ophthalmoscopy*. (3) *Visual acuity*. (4) *Near-point of accommodation* and *convergence*, and (5) *Versions*. Petry again stresses the use of survey teams, each man assigned to some particular part of the survey routine.

Ketchum[35] describes the method of appointment of the optometrist inspector for the Los Angeles school system and gives the following outline of the type of survey used in making visual tests on students. (1) *External ocular examination*. (2) *Symptoms*. (3) *Visual acuity*. This is recorded by the examiner both monocularly and binocularly. (4) *Diplopia test*. (5) *Dynamic Skiametry*. This is done to merely classify the case as to gross errors of refraction, and (6) *Ophthalmoscopy*. McFadden[22] writing with reference to visual surveys, made in the schools, suggests that each survey consist of the following routine; (1) *Visual Acuity*. This to be taken and recorded in percentage, both monocularly and binocularly. (2) *Skiametry*. (3) *Fogging Test*. This test made with plus lenses to further check those students found to be hyperopic by the skiametric tests, and (4) a record of notation made of the *Symptoms* of ocular fatigue or any other symptoms which may have a bearing on the visual problem. Bennett's[34] routine for school survey work is as follows: (1) the monocular and binocular *Acuity of Vision* is taken and recorded. (2) an examination of the anterior surface of the cornea is made with the *Ophthalmometer*. (3) *Static Skiametry*. (4) *Dynamic Skiametry* with fixation at 13 inches. (5) a parallax *Muscle Test* is made. (6) an *External Ocular Inspection* is made using focal illumination, and (7) the survey is concluded with an *Ophthalmoscopic examination*. Bennett is an optometric school eye examiner in Missouri and has examined 16,000 school children using the foregoing routine.

The method pursued by Silver[8] in the examination of thousands of school children proved, he claims, to be very satisfactory. Record charts were placed in the hands of teachers a few days previous to the day on which his survey was to be made. In order to expedite the work the

name, age and grade of those students to be examined was filled in ahead of time by the teachers. The survey staff consisted of two optometrists and a nurse. The apparatus used was the following: Ophthalmometer, luminous ophthalmoscope, trial frame and chart, a phorometer and a small electric transilluminator. The students were brought into the room in groups of eight. After four were examined, another group of eight entered. They were asked to stand in line at some distance from the examiners, where they could watch the tests being made on the other children. This was done to free their minds of any fear and to acquaint them with the routine of the survey. The (1) *Ophthalmometer* was the first instrument used in this survey by Silver. Then came the (2) *Ophthalmoscope*, which was followed by the use of the (3) *Retinoscope* wherein a check was made of the gross errors of refraction as well as a verification made of the findings of the ophthalmometer. Following these tests a (4) *Transilluminator* lamp was used to examine the external tissues of the eye and at the same time to test the pupilary reactions to light. The nurse was usually seated at a desk near the objective examiner and made a record of the findings on the students' charts. The chart when finished up to this point, in the survey, was then given to the student who took it to the subjective examiner for the final analysis of the case or for additional tests if these were felt necessary. These additional tests were (5) the *Subjective* test and the (6) *Phoria tests*. These tests were made on only certain of the students where doubt still existed, after the objective tests had been made. Silver feels that in most cases the objective tests alone will give the survey team all of the information needed and it must also be remembered that this was a visual survey and made only to discover refractive and ocular pathological conditions. No attempt was made to work out ocular prescriptions for any of the students. Those children needing further visual attention were urged to have this done, the ultimate examination being left to the examiner picked for this work by the family or parents of the child.

To again stress the importance of this type of school survey work let me point out that Simpson[26] claims that 15 per cent of the children entering schools today, do so with defects of vision, and that upon reaching the age of leaving school and entering industry that 30 per cent have defective vision. He also estimates that between 25,000,000 and 30,000,000 workers in this country have subnormal vision. Harman[27] estimates that the number of children needing ocular attention for refractive defects in England is about 20 per cent, while Silver[31] claims that at least 25 per cent of all students in our schools today have subnormal visual acuity. Dean[7] found that 35 per cent of all children in schools have defective vision, and these he divided into three groups: First, students who will be permanently relieved by the correction of improper illumination; this group embraces 10 per cent of the total student body. Second, another 10 per cent who need the application of lenses for temporary wear. And third, 15 per cent of the students who should and will have to wear a correction constantly.

Needles and Heather[29] report the results of an optometric visual survey made on the students or inmates of the Chicago Parental School for Delinquent Children. This survey required the services of eighteen examiners and extended over a period of two weeks. There were 308 children examined, their age range being from 8 to 14 years of age. The survey had for its purpose first, to ascertain the oculo-refractive needs of the children examined. Second, to supply necessary corrections to that portion of the student body in need of them, and third to obtain contributory data for a study of possible relations between oculo-refractive errors and general biological and pathological defects. This survey was much more elaborate than the average visual survey and covered a somewhat larger field. The survey routine covered tests having to do first with the general biological development of the student, next with visual defects other than actual pathology and last with general and ocular pathology.

Wolff[18] in his survey of school children considered not only their visual problems, but also studied these in relation to the student's Intelligence Quotient and to their Grade Acceleration. His survey included the following visual tests. (1) *Monocular Visual Acuity.* (2) *Ophthalmoscopic Examination.* (3) *Convergence Near-point tests.* (4) *Version tests.* (5) *Dynamic Skiametry.* (6) *Subjective tests,* and (7) *Phoria tests.* In comparing the student I.Q. with their grade acceleration and their visual problems Wolff finds it apparent that defective vision plays an important role in retardation of the school child the precocious child being retarded as well as the normal and the sub-normal.

Peckham[13] also studies the relationship between scholarship and poor vision and comes to the same conclusion as does Wolff. Peckham's visual survey of the students in Detroit includes the following tests: (1) Monocular *Visual Acuity at 20 feet.* (2) Near-point *Visual Acuity at 14 inches.* (3) *Stereoscopic Vision at 20 feet.* This is the test devised by Robert H. Peckham and shows if the student is using both eyes or if one is being suppressed. (4) *Fusion and Fixation tests at 14 inches.* Here is used the Peckham F-L-E test in an isosceles prism stereoscope. The test chart is so made that targets for testing foveal fusion and fixation are separate from the targets used to test peripheral fusion. (5) *Bar Reading Test.* This test is employed to determine if the basic binocular functions of retinal rivalry and binocular projection of monocular images are established and if the student habitually uses both eyes in reading. (6) *Dynamic Skiametry.* (7) *Ophthalmoscopic examination.* (8) *External inspection of the Eye.*

It is therefore obvious that the important matter of properly making a school visual survey is a much more involved professional task than is sometimes recognized and that the results of such a survey will be of great and lasting worth to the future health and well being of the students. Before going into further detail with reference to school visual

surveys let us next turn our attention to the survey work already done with the drivers of motor cars.

Visual Survey Work with Motor Car Drivers

For a time it was supposed that a great many accidents were due to faulty vision and it was then suggested that drivers of motor cars with a binocular acutiy of vision of less than 20/40 be prohibited from driving, until this sub-normal vision was corrected to a higher level. A careful study of the entire matter over a period of years, however, leads experts to suggest that while faulty vision may be a contributory factor in some accidents, it is nevertheless only one of several factors which have to be kept in mind in appraising and studying the entire problem. One thing has been proved and that is that a person who is otherwise normal in every respect can successfully drive a motor car with binocular vision as low as 20/60 and most recent authorities refuse to bar an applicant from driving unless his vision is less than 20/70 Snellen.

That vision is only one factor in the study of driving efficiency becomes obvious when a study is made of the entire matter of safety both from the angle of the driver himself; other motor car drivers and from the viewpoint of the safety of the pedestrian. In viewing the entire problem, one must consider first, the driver's mental approach to driving. This would include his knowledge of the mechanics of the car, his knowledge of traffic regulations and his mental approach to the problem of his relations regarding the welfare of others. It would include also a study of the speed of his mental reactions to given stimulus, and the further study of his motor reflex response to these same stimulus. In addition to these mental and neurological aspects, the problem of driving efficiency also depends in a measure at least, on the subject of being ablebodied, having reasonably good vision and at least a fair degree of hearing. Of all of the factors mentioned, I would without the slightest hesitancy place the driver's mental approach to problem of the welfare of others, first. Yet this is the hardest of all to valuate, and is outside the scope of this paper. Here we are to consider only the problem or rather that small but important part of the entire problem as it pertains to the driver's ability to see.

According to Silver[14], the National Advisory Commission on Vision for Motor Drivers has prepared the following standards of visual acuity for motor vehicle operators: Persons having not less than 63.9 per cent (20/70 Sn) visual acuity should be permitted to operate a motor vehicle. A standard of 63.9 per cent is the lowest safe acuity for the following reasons: 63.9 per cent, daylight acuity, is so reduced by darkness (average lighted streets) or by the presence of rain, snow and so forth on the windshield as to lower the effective acuity to 40.9 per cent (20/120), or in the event of a combination of both to 34.2 per cent (20/140). It is also recommended that drivers without glasses who have less than 63.9 per cent acuity and with glasses, 63.9 per cent acuity or better, be granted permits to operate only when wearing glasses and that this information

be plainly stated on their permits. The commission also advises that in all cases where vision in either or both eyes is 83 per cent (20/40) or less, that the person be informed of the findings. Although such persons might readily pass the requirements, the added advantage of normal vision might prevent accident. As to the field of vision, no person having less than 140 degrees should be granted a permit to operate a car even though their acuity be within the required standards. Where the applicant is blind in one eye, the seeing eye must have normal visual acuity and a field of vision that complies with the standards set forth above. If these rules are strictly adhered to the person may safely operate a motor vehicle. With color blindness, the commission has not found it a sufficient deterrent to debar an operator providing the defect is discovered and the applicant is given special instruction in differentiating between various light signals. According to Silver, scientists have been working on colored glass semaphores and have discovered that a mixture of blue with green makes it possible for a green color blind person to distinguish between green and red. But so far no substitute has been found for a red blind eye. Silver also claims that in the Washington traffic bureau they have found that the restrictions for color blindness, since the present semaphore has been in use, is less than one percent. Silver[20] has also compiled a series of suggestions for use (a) as a procedure for local traffic bureaus; (b) a procedure for special licensing bureaus or State Highway Departments, and (c) a procedure to be followed by the individual optometrist for use in his own office, should he be called upon to assist in making a driver's visual survey.

Doane[17] who had much to do with the establishment of State controlled visual tests for motorists in Massachusetts, suggests the following routine to be followed in making an ocular survey for this purpose. It will be noted here that near-point tests are entirely ignored as these have little or no part in the work of motor car driving. Let us take a hypothetical case and carry through a complete examination as suggested by Doane. The applicant presents himself wearing glasses. He is seated and given a record card on which he signs his name and address. The examiner then takes the card and makes notation of the applicant's license number, filling in also date and time. Applicant's glasses are then removed. Examiner notes carriage of head and records any irregularities, noting especially if head is tipped to right or left. (1) *Visual Acuity.* Doane provides a series of test cards for taking Visual Acuity. Test chart is then exposed with No. 1 card in place (illumination of cards being about 15 foot candles) and applicant is directed to read the letters with right eye (left eye covered). If successful in reading the letters on this card, he is given No. 2 card and record is made of smallest letter read under bright illumination. No. 3 card may be used if one wishes to be positive of 100% vision. Right eye is then occluded and left eye uncovered, proceeding in the same manner and recording the vision of left eye. Both eyes should then be covered, the operator using a card or device

large enough to cover both eyes of the applicant. While the eyes are covered, No. 4 card should be exposed. The operator then removes the cover quickly and, replacing it instantly, allowing the applicant only a quick glance at the card, requests him to read the card. This test should be carefully done, as it is intended to disclose whether the applicant actually sees quickly and accurately. The illumination for this test should be about 15 foot candles. The same test should be repeated with card No. 7 under the same illumination and then repeated again with cards No. 8 and No. 10 with illumination cut down to 5 foot candles. It may not be possible to secure the exact illumination as specified above, but it is necessary that the test with cards No. 4 and No. 7 should be with good illumination, while cards No. 8 and No. 10 should be with reduced illumination. In order to avoid one applicant informing another of the cards used in these tests, cards No. 5 and No. 6 may be substituted for card No. 4 and card No. 9 may be substituted for card No. 8. The record of the vision should be recorded both as visual acuity and visual efficiency in the proper spaces on the record card, also the amount of illumination used in the test.

Doane next proceeds to the test for (2) *Color Perception*. The left eye of applicant being covered, he is directed to look at the opening in the test chart over which a ground glass is inserted; he is asked to specify the color as the red glass is moved behind the opening and, in the same manner, the orange or yellow glass and then the green. Right eye having been recorded, the left eye is tested in the same manner. These tests should be made quickly. If the color perception is slow, this fact should be recorded. It has been pointed out that the tests for color perception should be given under varying conditions such as fog, smoke, rain, sleet, dust and snow. It is true that the visibility of color signals is affected by such conditions and it would be ideal to make tests in corresponding conditions. This we may arrange for in a crude way by providing different types of smoked and ground glass in the anterior opening of the horizontal slide. The color lantern of the Genothalmic Visual Test Apparatus includes such glass and if this apparatus is available, the test may be given in this way. At the present time, however, it may have to suffice to include a test for the colors in as simple a manner as possible and the one described above meets the fundamental requirements satisfactorily. As stated before, it is necessary to observe whether the subject or applicant distinguishes color quickly or whether it has to be studied. Doane suggests that if the applicant is slow but finally does determine the color correctly, records should be made of this with a recommendation that color perception may possibly be improved by educational development. The test for blue may be included in the routine if such a color is required where the applicant is to be employed.

(3) Proceeding then to the test for the *Field of Vision* the examiner should be provided with a suitable target which may be readily made by the cutting of a round disc of cardboard, one side of which should be

colored red with the other side colored green, the disc to be 8 mm. in diameter and fastened to a small handle made of wire or wood not over 1½ mm. in diameter and 8 inches long. This target we will designate as No. 1. The second target consisting of a white card on which is placed a black letter of moderate size. This target we will designate as No. 2. The examiner, when taking the field to the right side, should hold target No. 1 in the left hand and target No. 2 in the right hand. Holding target No. 2 against his own (the examiner's) forehead, the applicant is directed to fix his or her eyes definitely upon the letter and is cautioned not to move the head or allow the eyes to move from the point of fixation on the letter. The examiner then places the target No. 1 in proximity to target No. 2 so that the red disc is readily seen by the applicant. The examiner then moves the red disc to his left, on a horizontal plane, describing as near as possible an arc of 90 degrees to the right side of applicant. As the target is moved to the left through this arc, it should be rotated between the fingers and applicant required to tell whether he sees a red or green disc. At the point where the applicant is unable to see the disc, examiner should note the approximate angle at which the target disappears. With a little practice it can be noted quite definitely whether the target has been moved through an arc of 15, 30, 45, 60 or 90 degrees. Taking the field to the right should be done first and then the procedure reversed in taking the field to the left. In this case the examiner should hold target No. 1 in his right hand and target No. 2 in his left hand. Notation should be made on the record card for each eye and then the total to the right and to the left, the sum of which makes the final horizontal total. This procedure may be followed in a similar manner if it is desired to determine the field of vision up or down, moving target No. 1 through arc vertically.

The next test is that for (4) *Versions*. Target No. 1 as described above may be used for this. The applicant is directed to hold the head absolutely still while the examiner moves the target to the right and to the left, up and down, the applicant following the target with his eyes, without moving head, while the examiner notes whether both eyes move in proper relation to each other in the various directions. This test may be made slowly, and then rapidly so that notations may be made whether the versions are good or poor, rapid or slow. The test for (5) *Diplopia* then follows. This may be done with the plain glass before the opening in the cabinet or with Chart No. 1. Both eyes of the applicant should be covered and the blinder removed suddenly, asking whether the applicant sees one light or two or one row of letters or two, noting whether the displacement is vertical or horizontal.

New visual tests[11] for motorists were inaugurated in the State of Massachusetts during the middle part of December, 1929, when a new regulation became effective which requires all drivers of motor cars to come before the state motor car inspectors or else present a slip from some optometrist certifying that their vision was normal in each of the

following respects: Eye Tests. Before the applicant is given a road test, the examiner shall make an eye test for (1) *Visual Acuity*, for (2) *Field of Vision* and (3) of *Color Perception*. The cards for visual acuity are designed to be used at a distance of twenty feet. The cards with small letters are designated 20/70. The applicant must be able to read the 20/70 letters at twenty feet. These tests shall be made with each eye separately both with and without glasses. (1) Procedure. Measure twenty feet from a point at which the cards are to be placed. With the applicant standing at that distance from the card, the smaller card shall be exposed first. If the letters of this size are read correctly the notation of *Visual Acuity* should be made in the proper space provided on the application blank. If the small card cannot be read then the larger card is exposed and notation made as to applicant's ability to read this size letter. If he fails to read the larger size type, license will not be issued until vision is investigated thoroughly. In order to avoid memorizing, the test cards shall be displayed alternately and the applicant required to read letters in different positions on the card or to read the cards backwards or by switching from one card to another. While testing the right eye, applicant must cover his own left eye and vice versa. After each eye has been tested separately, the test is made with both eyes uncovered and the proper record made of vision with both eyes. (2) Test for *Field of Vision*. Applicant should be standing slightly less than arm distance from Examiner. Examiners shall require applicant to cover left eye with his own hand or fingers. Applicant is then directed to look at bridge of Examiner's nose. Examiner then places disk to right side on a level with applicant's eyes and back of the 90° meridian. Disk shall then be brought forward and applicant directed to indicate the moment he sees the disk. Examiner will then make notation of the angle at which the disk is first visible. This test shall be made with each eye. If applicant has but one eye, test shall be made both from right side and from the left. Examiner shall make record of the total degrees of field. (3) *Color Test*. This test shall be made with various color disks as furnished. Applicant shall be required to designate green, yellow and red. This can be done by asking applicant to pick out the green or the red or the yellow. The blue and white disks are also used so that an applicant will positively demonstrate his ability to determine the red, green and yellow colors. This test may be varied by the examiners as it is found necessary to determine the applicant's color sense. Applicant is passable if he can read 20/70 with or without glasses. An applicant must have a field of vision of 120° total. An applicant must be able to distinguish red, green and yellow colors. If applicant fails in any of these tests he shall be advised to have a thorough investigation made of his eyesight, and then apply for another examination when the defect has been remedied. If an applicant passes the eye test with glasses, a record of this shall be made upon the examination permit in order that the license may be restricted to operation with properly fitted glasses. If an applicant fails to show the required field of vision he will be required to have his auto-

mobile equipped with mirrors so situated as to give him a full field of vision both to right and left, and license will be restricted to operation with this provision.

Visual tests for motorists were made at the Indiana Automobile show by an optometric team under the direction of Dr. E. Curtis.[32] The tests were made, using the following routine. (1) *Visual Acuity.* (2) *Fusion tests.* (3) *Depth Perception tests.* (4) *Visual Fields.* (5) Determination of *Time required for Reaction to Visual Signal.* (6) Determination of *Time required for Reaction to Sound Signal.* The depth perception test was made by using the rod test. This consists of two upright rods placed some distance apart. Each rod is on a movable base and each is controlled by long cords in the hands of the applicant. The rods are about twenty feet from the applicant. The applicant is required to pull the cords in such a manner as to bring the movable rods as near each other as possible, the rods being seen in sharp contrast before a well illuminated background. The determinations of the time required for reaction to a visible signal and to a sound signal were made by means of a device constructed especially for the purpose, consisting of a concealed falling object which at the start of its fall closes an electric contact, lighting a signal lamp or ringing a small bell according to the decision of the operator making the test, and a means for catching the object in its fall actuated by a lever pressed by the applicant being tested as soon as the signal was recognized. This lever controlled a recording timing device which gave in fractions of seconds the applicant's reaction to both visual and sound stimulus.

Several years ago the writer[10] suggested that subjects or applicants who applied for a visual test in getting their driver's license be made to sign the record card thus establishing their identity and through their signature, eliminating the possibility of one person substituting for another. At this time I might add to this, the advisibility of having each applicant finger-printed at the same time his visual tests are made, this last suggestion being an aid in identifying the applicant should he become involved in a serious or fatal accident at some future date. This last suggestion would also serve to eliminate the possibility of one person taking the driver's tests for another.

Arrington[15] in a chapter dealing with visual surveys reviews in some detail the work done by the New York State Optometric Association and the suggestions made by the American Optometric Association regarding the necessary visual acuity of drivers of motor cars and the survey work which should be done in this field. These surveys, he claims, should have as their minimum examination procedure the following: (1) *Visual Acuity.* This test to be made both corrected and uncorrected and both monocularly and binocularly. (2) *Color Vision.* (3) *Visual fields,* and (4) *Diplopia test.* To this McFadden[16] suggests that visual surveys made on the drivers of motor cars be made in such a manner that the subject or applicant be placed in a seat arranged similar to the control seat of a

motor car and have him execute tests both visual and mechanical, his response being automatically graphed as he handles the controls, thus making not only a valuable record of his visual acuity but also of the speed of response of his motor reflexes.

Judd[28] did some interesting optometric work in this field, using as his survey material persons who had actually been involved in serious automobile accidents in the city of Detroit. His work was undertaken for the purpose of determining, if possible, the exact status of the relation of ocular vision of the driver of the car to the accident in which he was involved. Judd included in his visual survey a test for quickness of perception as well as the more routine visual tests. His survey work included the following clinical tests. (1) *Quickness of perception.* For this test a special slide was constructed for use in the Clason visual acuity meter. This slide consisted of the word "STOP" produced in a size equal to the type of Clason slides No. 1 and 2. The use of this slide was based upon the theory that objects are recognized from or by their form, before they reach the size in visual angle which subtends the visual angle for the distance at which they are recognized. In using this slide, Judd would seat the subject before the screen, and prior to turning on the instrument would say to the patient: "Kindly state what you see and what action you would take as soon as you are sure you see it." The slide was then illuminated and the image gradually increased in size until the subject responded "Stop." Their quickness of response was estimated as a measure of their mental alertness as well as their visual acuity. (2) *Visual acuity.* To measure the subject's visual acuity Judd used the parallel line test. This he accomplished by using the astigmatic ball slide of the Clason visual acuity meter, having the subject report as soon as the black lines were seen and tell the direction in which they were noted. (3) *Color vision test.* Judd also employed the Clason visual acuity meter in making this test. Here he employed two slides. The first being the diaphragm slide in which the smallest round aperture was used, and the second being a special slide having red, orange, green and blue filters, these being shown in various order, the subject being asked to state the color seen. (4) *Field of vision.* This was taken monocularly using the McHardy-DeZing self registering perimeter, using the 3 mm. aperture, illuminated. Four meridians were taken for each eye these being temporal, nasal, up and down.

Lauer's[30] survey of motorist's vision and time reactions covered several summers, and as it was a portable clinic was made to operate under various conditions and with all the types of motor car drivers. In his research work he was assisted by the American Optometric Association. His study of this subject led him to develop the following routine which covered, he believed, the most important matters to be investigated in making a study of the reactions of those who would drive a motor car. (1) Clason Acuity Meter with phoropter for measuring *Visual Acuity.* (2) *Astigmatism.* (3) the *Phorias.* (4) Parson's test for *Ocular Domi-*

nance. (5) Ishihara test for *Color Vision.* (6) Nuchols test of *Field of Vision.* (7) Glarometer test of *Sensitivity of Retina to Extraneous Light.* (8) Cheiroscope for *Detecting Scotoma.* (9) Tests for *Distance Judgment.* (10) Special apparatus for measuring *Motor Coordination, Speed of Movement, Reaction Time, Strength of applicant,* and *Mechanical Intelligence.* (11) Tests for *Blood Pressure.* (12) Tests of the applicant's *Auditory Acuity,* and (13) a composite *Performance Test* for measuring reactions similar to actual driving.

It becomes quickly apparent, from this short review of suggestions made to valuate the ocular qualifications of applicants for driver's licenses that this is the work of optometric societies. These bodies are fully capable of making such surveys, their membership being qualified to technically diagnose the results of these tests and also being able, because of their training to work with others interested in other portions of the health, engineering and safety phases of this problem. That visual surveys of motor car drivers should be made is no longer a question. This is one of the factors which have a bearing on general safety, and is one of the many phases of this problem which can, without going to large expense, be solved. The fact that it is but a part of a larger problem should not stop optometric societies from taking their rightful interest in the matter, and this interest should and must continue until all motorists are having visual tests made as a part of their qualification program for driving motor cars.

Visual Survey Work with General Groups

This portion of the visual survey work program is a very important part as it is through this medium that many citizens can be reached with advice on proper eye care. Visual surveys conducted at places where large crowds gather can serve the two fold purpose of giving those persons who pass through the survey routine information of immediate value to them regarding their eyes as well as ocular hygienic advice which will be of lasting benefit to them. In addition to these important services to the public, the profession can gather much valuable statistical material with reference to the prevalance of eye refractive conditions by means of these surveys. This is particularly true if the surveys are made by optometric societies under the direction of some national committee. This committee serving under the direction of and with the help of either the American Optometric Association or the American Academy of Optometry. These parent organizations should supervise the work thus assuring uniform results wherever the survey is made. Some fine independent work in this field has already been done, yet in many centers no surveys have been attempted and in these as well as centers already having experience in this work, the optometric survey should be expanded and developed as part of a national program which will enable optometry to ethically perform much good service for the public.

Eimer[2] advises the following techniques to be employed at visual

survey clinics, suggesting the use of a number of optometrists, each to serve as clinician to perform one part of the work. This ocular work can be done either as a visual survey or as a complete refraction depending on the objectives of the survey. The first clinician takes the (1) *Case History* and *Symptoms,* recording these on the record chart. The patient is then sent into the next room, where the second clinician makes an (2) *Ophthalmometric study* of the anterior surface of each cornea. The patient is then taken into a third room where the next optometrist makes an (3) *Ophthalmoscopic examination.* Then on to the next room, where the fourth clinician makes a (4) *Skiametric examination* of the case. If a complete examination is to be done this is of course then made to determine the exact refractive condition present. If a survey is being made then only gross errors of refraction are recorded. In cases where a complete refraction is being made, the patient is next given a (5) *Subjective examination* by the next clinician. This is followed by the (6) *Tonicity* and *Duction tests* made by the sixth optometrist of this group of clinicians. The final step being the (7) *Diagnosis* made by the Chief of Staff, of the survey or clinic. Barr[4] suggests adding to visual survey work, the two important matters of advice on eye hygiene and illumination, having someone present at each survey period whose undivided duties will be to discuss these matters with those persons having the survey made. Kiekenapp[6] in his outline of the American Optometric Association Clinic Plan stipulates that the technique of the survey should at least consist of (1) *Ophthalmoscopy.* (2) *Dynamic Skiametry.* (3) *Field Charting* as well as (4) *Duction* and *Tonicity* tests. In addition to these, it is suggested that to these minimum requirements, be added (5) *Ophthalmometry,* (6) *Static Skiametry* and (7) *Subjective testing.* While Clements[3] describes the routine tests used in estimating the heterophorias of aviators, and suggests these be added to all survey routines. claiming that eighty per cent of all air accidents, and a large percentage of all other accidents, are due to faulty judgment of speed and distance in which an heterophoria frequently plays an important part.

The survey routine of a visual survey conducted recently in Los Angeles[5] by the California State Optometric Association comprises the following visual tests. (1) *Visual Acuity.* A Projector Chart was used and notations were made of the monocular and binocular uncorrected visual acuity. (2) *Color Vision.* Here the subjects inspected and called off the Ishihara Test Cards, and after finishing these passed on to a Luminous Miniature Traffic Signal where they were asked to state the colors shown. (3) *Distance Judgment.* Here was used the Dolman or Standard Army Aviation Test. (4) *Tests for Binocular Co-ordination.* This test was nothing more or less than a red glass diplopia test, and (5) *Visual Field Test.* This test was made using a standard perimeter with 5 degree test objects. This test was given in the horizontal meridians only, each eye tested separately.

Summary of Suggested Survey Examination Routines

Up to this point this study has concerned itself chiefly with a review of some of the literature dealing with the subject of the examination procedure to be followed in making a visual survey, and eighteen different visual surveys have been outlined as they have been presented to the profession after having been used in either industry, schools, in visual clinics for Motor Car Drivers or at some general gathering where visual surveys were made. Two of these survey routines were used in industry. These were by Dublin and Ginestous. Eight of them, by Cox, Petry, Ketchum, McFadden, Bennett, Silver, Wolff and Peckham had to do with school visual survey work. Five had to do with the examination routine employed in making the survey of Motor Car Drivers. These were by Doane, Curtis, Arrington, Judd and Lauer, and the final three, which had to do with general visual survey work, were by Eimer and Kiekenapp as well as a review of the data presented by the California Optometric Association as a result of the survey recently made in Los Angeles. Table One summarizes the tests which were used in making these eighteen visual surveys and the number of times each test was used or suggested for use by the men just mentioned. It is interesting to note here, that of the twenty-one suggested tests only four of them were used in ten or more of the surveys. This indicates a lack of uniformity in work of this kind and also indicates a need for some sort of standardization of survey procedure if the results are to be of value to the public.

Now just what information were these examiners attempting to get by means of these visual surveys just reviewed? First, it was essential to know whether or not the eye under observation was free from disease or anatomical disorders. Second, it was important to know the subject's approximate ability to see distant objects distinctly. Third, it is equally important to know the subject's approximate ability to see near work with ease and comfort. This is true in all cases except those surveys made with regard to the motor car driver. Fourth, it was important to acquire at least some data on the balance between accommodation and convergence. Fifth, a short inquiry into the subject's ability to discriminate between certain of the primary colors was felt to be essential. Sixth, a record of the History and Symptoms was at times felt to be of value and Seventh, a record of the subject's field of vision was, particularly for the motor car driver, felt to be of value. There were other tests suggested, but the foregoing cover most of the essential points suggested in making any kind of a survey of the patient's vision.

Recommended Standard Examination Routine for Visual Surveys

In making visual surveys three factors are quite important. The first one is that the work be done accurately, the second is that the work be done quickly, and the third is that it be done thoroughly. If the public is to be invited to participate as subjects, in an optometric visual survey, it is necessary to assure them that the survey will be done in such a

TABLE ONE

TESTS EMPLOYED IN SURVEY WORK

Suggested test.	Number of times test was suggested for use
1. Case History and Symptoms	5
2. Uncorrected monocular visual acuity	15
3. Binocular near-point visual acuity at 14 inches	1
4. External ocular inspection	6
5. Ophthalmoscopy	10
6. Fusion, phoria or tonicity tests, with fixation at 6 meters	13
7. Near-point of accommodation tests	3
8. Near-point of convergence tests	3
9. Versions	4
10. Cover test	2
11. Skiametry, Static or Dynamic	11
12. Ophthalmometry	6
13. Subjective testing	5
14. Bar reading near-point test	1
15. Tests for color vision	7
16. Visual Field tests	8
17. Depth perception or Distance Judgment tests	3
18. Visual speed and time reaction tests	3
19. Tests for ocular dominance	1
20. Glarometer test for retinal sensitivity	1
21. Diagnosis and Advice	2

manner as to reveal any and all existing ocular abnormalities and also that it will not take very much of their time. This is true in industry, in schools or at any other point where the survey is to be made. Speed, thoroughness and accuracy are very important in this type of work and for this reason it seems to the writer essential to have these surveys made, as I have said before, under the auspices of optometric societies. Not only will this give "standing" and "background" to the survey but it will at the same time provide the necessary man power needed to do an effective piece of work.

As Petry, Cox and others have suggested, visual survey work is best done by first forming a survey team composed of several or more optometrists who, working as a unit, each doing one or more parts of the examination, complete the survey in as short a time as is possible. The procedure about to be suggested is based upon this unit or team idea and is one which will readily fit into any local optometric society as it requires but a few optometrists, little outlay in funds, and only equipment already in the possession of optometrists.

The survey team would require the following equipment. Record

Charts, to be filled out for each person taking the survey. Test Chart for distance visual acuity. Reading card for near-point tests. An illuminated color test, a hand slit-lamp, an ophthalmoscope, a trial case and trial frame, a perimeter, a phorometer and a retinoscope. In addition to these ocular refractive instruments, a number of folding chairs would have to be provided on which the applicant would sit as he or she was worked on by first one examiner and then another. If suitable space can be secured, it is advisible to arrange seven booths by means of screens and have the subjects progress from one examiner to the next, each optometrist working in his own booth. This is an ideal arrangement but is not necessary. What is necessary is that space be provided so as to enable seven optometrists and a secretary to work without persons getting in their way as they await their turns.

The suggested survey team is composed of seven optometrists and a nurse or secretary. The secretary meets the applicant, and places upon the record chart the subject's name, address, history, symptoms, age, sex, and occupation. The chart is then handed to the applicant who is directed to the optometrist who starts the survey work. When he has finished, he fills in that part of the record chart dealing with the portion of the survey he has made, and then directs the subject to the second optometrist who then performs his part of the survey routine. The actual examination is made by six optometrists, the seventh optometrist reviewing the completed chart, and advising the subject as to his or her condition, and supplementing this advice with some general information on ocular hygiene. The recommended standard examination routine for visual surveys is made by the seven optometrists each man doing the following part of the work.

OPTOMETRIST NO. 1. This man is responsible for five visual tests. These are (1) Uncorrected *monocular Visual Acuity at 20 feet* for those subjects who are not wearing glasses at the time of the survey, or Corrected *monocular Visual Acuity at 20 feet* if they are wearing glasses. (2) *Binocular near-point Visual Acuity at 14 inches.* (3) *Near-point of Accommodation* test. (4) *Cover test* and (5) Tests for *Color Vision.* In all of these tests subjects who are wearing glasses should keep these in place. The technique of making these five tests is as follows: The near-point reading card is placed immediately before one of the subject's eyes and attention is directed to the test chart placed at 20 feet with the request that the subject read, from left to right, the smallest letters on the chart with the uncovered eye, these being the 20/20 or normal line of letters, or if this cannot be done, to read the lowest line that can be read easily. A notation is made of this finding. The near-point reading test card is then placed before the other eye thus covering it, and the patient is asked to repeat this performance, this time reading from right to left. Again a notation is made of the visual acuity, and also of the results of the cover test, which has been made at the same time the monocular visual acuity was taken with the card which was held before the

patient's eyes. This has taken but a few moments and already the examiner has a record of the subject's distance visual acuity and also has a notation of the monocular behavior of the subject's eyes when under the cover test, with alternate fixation at 20 feet. The examiner now hands the near-point reading card to the subject asking that the Number 5 or Number 6 type on the card be read. When this is finished the examiner then requests the subject to slowly move the card up towards his or her eyes until the smallest type already read, becomes blurred, also requesting the subject to hold the card still at this near point. When the subjects stops moving the card a notation is made of this distance. The optometrist then takes the reading card from the subject, and records on the record chart the subject's near-point binocular visual acuity as well as the subject's near-point of accommodation. The examiner next directs the subject's attention to a series of colored lights which he turns on, one after the other, asking the subject to name each color. A record of this finding is made and the subject is directed to proceed on to the next examiner.

OPTOMETRIST NO. 2. This man is responsible for two visual tests. These are (6) *External Ocular Inspection*, and (7) *Ophthalmoscopic* examination. Here the patient is seated and an examination is made of the anterior surfaces of each eye with the aid of the hand slit-lamp. Then the media and fundus of each eye is examined by means of the ophthalmoscope. In every optometric society, some optometrists become more proficient with the ophthalmoscope, than do others, and it is essential to select for this number Two position on the survey team, a man who can get results in an ophthalmoscopic examination under any and all conditions. After these two tests have been completed a notation is made of the findings on the record chart, and the subject is requested to proceed on to the next examiner.

OPTOMETRIST NO. 3. This man has but one portion of the examination under his supervision, this being (8) the *phoria findings at both 20 feet and at 13 inches*. These are made in the usual manner with the aid of the phorometer, the subject again keeping his glasses in place before his eyes behind the instrument. Notations are then made on the record chart of these findings. The subject is then requested to again proceed on to the next examiner.

OPTOMETRIST NO. 4. This man is also responsible for two visual tests. These are (9) *Near-point of Convergence* tests, and (10) *Versions*. These tests are made as follows: Subject is seated and instructed to closely follow with his or her eyes the end of a small pointer held in the hand of optometrist No. 4. This pointer is held about 16 inches before the subject on the level of the subject's eyes and is slowly moved up toward the patient, the examiner noting the exact point or distance from the subject to the pointer that the subject's two eyes stopped following or "fixing" the small pointer. This point or rather this distance is the subject's near-point of convergence, and this distance is noted on the record chart.

The examiner next again seats himself before the subject, again instructing the subject to fix or watch the end of the pointer, and the versions are taken both monocularly and binocularly. This technique has been fully described by the writer[37] in a recent issue of this JOURNAL and so will not be repeated here. The results of the version tests are then recorded and the subject is again instructed to proceed on to the next examiner.

OPTOMETRIST NO. 5. Here also a "key" man is needed. He has but one test to make but it is an important one. It is (11) *Dynamic skiametry*. The subject is seated and the trial frame is put in place. With the aid of lenses from the trial case the subject's dynamic skiametric findings are taken and recorded. In the hands of an optometrist, skilled in this work, this section of the survey becomes of great importance. In this survey work it is not necessary to write an ocular formula but rather to record the gross error within one-half to one diopter. As soon as this has been finished the subject is again requested to proceed on to the next examiner.

OPTOMETRIST NO. 6. This man also has but one test to make. This has to do (12) with the subject's *Field of Vision*. Here the patient's fields are charted monocularly on the perimeter. It is not necessary to chart the entire field but rather the horizontal fields of each eye, as the test is being made not from a diagnostic viewpoint but rather to assure the examiner and the subject that from the accident prevention standpoint the fields are normal. These findings are then recorded and the subject is next referred on to the final step of the survey.

OPTOMETRIST NO. 7. With the completed record chart before him and with the subject's occupation, age, history and symptoms as a guide, a *summary of the case* is made to the subject. This requires tact, skill and some practice, yet it can be done in such an effective way that much good results to the subject as well as to the profession of optometry. If time permits matters of ocular hygiene regarding faulty illumination, posture and general care of the eyes can also be touched upon as well as giving the subject a record or a certificate upon which will be placed the subject's distance visual acuity finding recorded, in this instance, on the percentage basis. On leaving the survey room the subject can also be given, by the nurse or secretary, literature dealing with the care of the eyes which has been prepared by the society for this purpose. I will now review the steps taken in making this suggested standard examination routine for visual surveys.

The applicant or subject is met by the nurse or secretary who fills in the subject's name, address, occupation, history, symptoms, age and sex on the record chart, then referring subject to,

Optometrist No. 1,

(1)—Monocular visual acuity at 20 feet.
(2)—Binocular near-point visual acuity at 14 inches.

(3)—Near-point of accommodation.
(4)—Cover test.
(5)—Color vision.

Optometrist No, 2,
(6)—External ocular inspection.
(7)—Ophthalmoscopic examination.

Optometrist No. 3,
(8)—Phoria findings at 20 feet and at 13 inches.

Optometrist No. 4,
(9)—Near-point of convergence.
(10)—Versions.

Optometrist No. 5,
(11)—Dynamic skiametry.

Optometrist No. 6,
(12)—Fields of vision.

Optometrist No. 7,
Diagnosis, summary and advice.

A visual survey conducted in the manner outlined will fully meet every requirement of industry; it would more than care for the applicant for a license to drive a motor car; it would select and segregate those children who require additional visual care and when made on large blocks of the public would enable the optometric society to advise with authority thousands of citizens in the matter of ocular care. As I have already said, there is a need for this work and by systematizing the examination routine and having the surveys made in a uniform manner throughout America, under the general supervision of one of our large optometric societies, a vast fund of valuable statistical material could be developed which would prove to be of great value to our profession and at the same time a vast amount of good would result as thousands and thousands of persons now needing visual attention are doing without it because they are unaware of the cause of their discomfort.

The formation of visual survey teams by local optometric societies and their active work in this field would be an important step in the direction of preventive optometry. From the standpoint of the individual so served the survey would result in better health, visual improvement, a freedom from fatigue and an increase in personal efficiency. The public as a whole would profit as the work would be in a large measure an important factor in Public Safety. Industry would find it of great service as the results of such survey work would result in greater production and many fewer accidents, while school children would benefit inasmuch as this form of visual survey work would do much towards eliminating

fatigue caused by near-point work as well as improving the visual standards of our citizens in the years to come.

Every optometrist should at once interest himself and his local optometric society in this important work. In the writer's belief, there is nothing we can do as optometrists, to improve the position of our own profession in the eyes of the public, which will do as much, as can be done by the establishment of visual surveys carried on in the manner just described. The work will accomplish much good, and as such will gain the recognition and good will of many of our citizens. Freed from any commercial tinge, and based upon doing a good piece of clinical work, these surveys, carried on in every part of the country, will prove a professional rampart against the raids of those commercial institutions whose only interest is the sale of material. Optometry needs this type of activity. The public also requires the advice and service this work would supply. The time is ripe for the effort.

Carel C. Koch.

BIBLIOGRAPHY

1. Koch, Carel C. Some notes on visual surveys and the relative distribution of cases with subnormal visual acuity. American Journal of Optometry. Vol. 14, No. 3, pp. 105-118. 1937.

2. Eimer, E. The Michigan plan of optometric clinics. The Optical Journal and Review. Vol. LIII, No. 17, pp. 23-24. 1924. Referred to by C. C. Koch in a Special Report on Post-Graduate Clinics. Northwest Journal of Optometry. Vol. 2, No. 4, pp. 109-110. 1924.

3. Clements, C. Ophthalmology in relation to navy, army and air force. British Medical Journal. Oct. 13, 1923. pp. 654-656.

4. Barr, F. P. Visual Survey work. American Journal of Optometry. Vol. 2, No. 11, p. 336. 1925.

5. Los Angeles County Fair Visual Survey. Survey conducted under the auspices of the California State Optometric Association. Report published in the *Lumigram*. Bulletin of the Western Institute of Light and Vision, January, 1937, pp. 1-3. Published at 119 South Edgemont St., Los Angeles, Calif.

6. Kiekenapp, E. American Optometric Association Clinic Plan. Optometric Weekly. Vol. XV, No. 2, pp. 61-62. 1924. Referred to by C. C. Koch in a Special Report on Post-Graduate Clinics. Northwest Journal of Optometry. Vol. 2, No. 4, p. 110. 1925.

7. Dean, R. S. Greater efficiency through better vision in industry. Northwest Journal of Optometry. Vol. 1, No. 8, pp. 150-156. 1924.

8. Silver, E. H. Vision tests in schools and colleges. A manual of Optometric Jurisprudence. Edited by Dr. L. P. Folsom. Published by the International Association of Boards of Examiners in Optometry. South Royalton, Vermont. pp. 17-18, 1930.

9. Petry, E. Routine eyesight survey of school children's eyes. Published in monograph form on visual survey work by Barr. No. 3, p. 169.

10. Koch, Carel C. A routine ocular examination for motor drivers. American Journal of Optometry. Vol. 5, No. 3, pp. 136-141. 1928.

11. Koch, Carel C. Massachusetts Motor Vision Survey. American Journal of Optometry. Vol. 7, No. 1, pp. 48-50. 1930.

12. Dublin, R. Optometrists method of conducting visual surveys. Optical Journal and Review. Vol. LII, No. 24, p. 36. Referred to by C. C. Koch in a Special Report on Visual work in Industry. Northwest Journal of Optometry. Vol. 2, No. 6, pp. 167-172. 1925.

13. Peckham, Ray Morse. An investigation of the visual efficiencies of 10,000 school children and the correlation of vision and scholarship. American Journal of Optometry. Vol. 13, No. 9, pp. 321-343. 1936.

14. Silver, E. H. Safety vision for motorists. A manual of Optometric Jurisprudence. Edited by Dr. L. P. Folsom. Published by the International Association of Boards of Examiners in Optometry. South Royalton, Vermont. pp. 25-33. 1930.

15. Arrington, E. E. The History of Optometry. Published by the White Printing House. Chicago, Ill. Chapter XX, pp. 218-228. 1929.

16. McFadden, F. Additional technic and procedure for optometry to give best service in ocular examinations. Optical Journal and Review. Vol. LV, No. 8, pp. 29-31. Abstracted in the Northwest Journal of Optometry. Vol. 2, No. 5, p. 137. 1925.

17. Doane, H. Procedure in making visual tests. Published in monograph form on visual survey work by Barr. No. 4, pp. 250-252.

18. Wolff, J. The school child as viewed from his mental and visual equipment. American Journal of Optometry. Vol. 7, No. 10, pp. 558-564. 1930.

19. Dublin, R. Record charts for industrial survey work. Published in monograph form on visual survey work by Barr. No. 3, p. 25.

20. Silver, E. H. Visual standards for automobile drivers. Journal of the American Optometric Association. Vol. 7, No. 6, pp. 14-20. 1936.

21. Petry, E. Visual surveys in schools. American Journal of Optometry. Vol. 7, No. 3, pp. 137-141. 1930.

22. McFadden, F. Some notes on a school examination. Optical Age. Vol. XIX, No. 9, pp. 35-38. 1923.

23. Cox, C. E. A new method of making school surveys. Rochester School of Optometry, *Focus*. Vol. 4, No. 3, pp. 25-34. Abstracted in the Northwest Journal of Optometry. Vol. 1, No. 3, pp. 51-52. 1924.

24. Report of the New England Conference of Industrial Physicians. The Ophthalmic Year Book. Vol. XX, pp. 393-394. 1924.

25. Silver, E. H. Visual requirements and eye tests in industry. A manual of Optometric Jurisprudence. Edited by Dr. L. P. Folsom. Published by the International Association of Boards of Examiners in Optometry. South Royalton, Vermont. p. 19. 1930.

26. Simpson, R. E. Defective vision and industrial accidents. American Journal of Physiological Optics. Vol. V, No. 1, pp. 48-56. 1924.

27. Harman, N. Bishop. The organization of school ophthalmic work. British Medical Journal. May 28, 1921. Abstract in the American Journal of Physiological Optics. Vol. V, No. 3, pp. 399-401. 1924.

28. Judd, H. D. Survey of ocular vision as related to automobile accidents. American Journal of Physiological Optics. Vol. VII, No. 2, pp. 207-217. 1926.

29. Needles, W. B. and Heather, W. Jerome. Preliminary report on an optometric survey of delinquent children at the Chicago Parental School. Vol. VII. American Academy of Optometry. pp. 157-169. 1932.

30. Lauer, A. R. A portable research clinic and its value. American Journal of Optometry. Vol. 12, No. 3, pp. 85-90. 1935.

31. Silver, E. H. Vision tests in schools and colleges. A manual of Optometric Jurisprudence. Edited by Dr. L. P. Folsom. Published by the International Association of Boards of Examiners in Optometry. South Royalton, Vermont. p. 11. 1930.

32. Mendelsohn, W. Automobile drivers tests. American Journal of Optometry. Vol. 8, No. 5, pp. 174-176. 1931.

33. Petry, E. Origin and development of eyesight survey committee. Rochester School of Optometry, *Focus*. Vol. 6, No. 2, p. 17. 1926. Abstracted in the American Journal of Optometry. Vol. 3, No. 2, p. 56. 1926.

34. Bennett, A. M. School survey work. Optometric Weekly. Vol. XIX, No. 30, pp. 1078-1079. 1928.

35. Ketchum, W. H. Optometrist inspector appointed for Los Angeles Schools. Optical Age. Vol. 20, No. 8, pp. 53-55. 1924. Referred to by C. C. Koch in a Special Report on School Surveys. Northwest Journal of Optometry. Vol. 2, No. 2, pp. 42-43. 1925.

36. Ginestous, E. Visual examinations and conditions affecting visual aptitude. Ann. d'Hyg. Vol. V, pp. 311-321. 1923. Abstracted in the Ophthalmic Year Book. Vol. XXI, p. 280. 1925.

37. Koch, Carel C. Illustrated and graphic record charts. American Journal of Optometry. Vol. 13, No. 12, pp. 469-470. 1936.

* * * * *

SPECIAL REPORTS

THE CHARACTER OF THE OPTOMETRIC PRACTITIONER*

Laurence P. Folsom, Opt.D., F.A.A.O.
South Royalton, Vermont

In this paper I shall seek to discuss a phase of optometric practice which is too often overlooked. It is my firm belief that the successful practice of any profession depends in a greater degree upon the individual himself than upon his skill or training. No matter how skilled the practitioner, if he antagonizes his patients they will neither return nor refer others to him. And if he be only moderately trained but holds the love and admiration of all who know him his practice will grow steadily. And thus I have selected this subject for my discussion:

Character, the First Requirement

What is personality? It is the sum of one's qualities of spirit, mind, and character. It is that which makes an individual different from all others. Personality is NOT one's physical appearance, one's clothing, one's office, one's manner, nor one's behaviour. There are other and deeper measures of a man than the number of clean shirts he puts on daily and the cost-price of his motor car.

Judging Values

There is too great a tendency these days to concern ourselves with outward things. We delve into the study of psychology and the workings of the human mind and seek to apply its teachings in a more or less mechanical manner, that we may properly impress our patients and prospective patients. We have been told that "all the world's a stage and all the men and women merely players."

We have sought short cuts and easy ways to *act* our parts. We are told to use this or that smile for this or that occasion; to place emphasis here and to lower our voice at that point. We are even given the exact words we are to use, told when to use them, and trained in their proper

*An abridgment of the material presented before the American Academy of Optometry at Chicago, Ill., August 23, 1936.

euphony. We are taught when to tilt back in our desk chair at the correct point in our procedure, when to keep our coats buttoned and which button to use, how to hold our heels together at the proper time, and, in short, how to ACT our part upon the world's stage.

I maintain that all of these attempts at "acting" are but approaches from the wrong end of our problem. It is like teaching a man ophthalmoscopy before we have taught him anatomy and pathology; it is like teaching lens-grinding before we have taught optics; like giving instruction in advanced calculus before we have learned arithmetic. We are too prone, in these days of hustle and worry, to overlook the simple essentials of social relations.

What is the effect of such a wrong approach? How is it interpreted by our patients? How have we ourselves interpreted the "actors" we have met and known? First of all we say that he is "a bag of wind," or else we say that he "is hollow," or "he does not ring true." We shun such people. No one has the slightest difficulty in recognizing the insincere and the pretenders whom he meets. Our immediate reaction is to question all that they do, say, or recommend.

Is it not time, then, that we pay less attention to the "brain-trusters" of our present day and spend a little time with the earlier philosophers of written history? Wiggam in his book, "The Marks of An Educated Man," says, "What matter is it if you have all of the diplomas and degrees in the world if other people do not like you? Human relationships are still the main thing. If a man fails in his work it is not his work but HIMSELF which is not appreciated; the reason for his failure lies almost entirely within HIM. Be genuinely yourself, do not try to put on airs or to act a part; the world is full of people who are playing to the galleries."

And Dimnet, in his work, "The Art of Thinking," says, "If you want to do worthwhile work, Be Yourself. Adopt no pose nor pretense. Pose means playing at being something which one is not. How can a man be a worker when he is nothing but an actor? The more we use acted, spoken, or written insincerity the less is our chance of growing to what we could really grow to be."

In short, that which is done for effect is interpreted by others as having been done for effect. No one is fooled except he who plays the part of the "actor."

What then is the correct approach to a truly professional personality? On what basic fundamental shall we make ourselves truly noble and likeable? The answer is simple. This one basic essential for all pleasant human relations is none other than a sincere love for your fellow men.

Human Relationships

The first Primal Law of mankind is selfishness. The first thought of man, when he became a thinking being, was to acquire things for

himself. The first law of human nature was to get and to hold; to satisfy one's wishes and desires. For countless centuries early man fought, stole and killed in his efforts to satiate himself. There was no other law than selfishness.

Civilization begins only when man can learn to submerge his personal likes for the common-good. Self suppression, that is, sacrifice for the common good, is the first basic fundamental in civilization. But this is not enough. "To Live and Let Live" is being only *half* civilized. One must go further. Not only should we be tolerant of our fellow-men but we should hold a sincere desire to be good to them, to help, to assist, to succor, and to serve them.

Ralph Waldo Emerson has expressed this ably in his words, "The secret of culture is to learn that a few simple points steadily reappear and that these few alone are to be regarded: the escape from falseness; the courage to be what we are; the love of the simple, beautiful, and honest; cheerful relations with others; these are the essentials, these and the wish to serve, to add something to the well-being of our fellow-men."

As far back as written history can be found this one basic fundamental flows through the teachings of all leading philosophers. Today, being Sunday, is not a bad time in which to make a few studies in social relationships. Let us begin with Akhenathen who, thirteen hundred years before Christ, taught the doctrine of the universal love of God and the universal brotherhood of all mankind.

A hundred years later the law-giver, Moses, brought humanity a big step forward. He taught his "Laws" orally, finger by finger, in groups of ten. While there are more than one set of commandments, those generally accepted and known as "The Ten Commandments" contain most of the basic fundamentals of social relationships.

About six hundred years later Zoroaster built up a system of ethics for which all the world is his debtor, and during the same period Jeremiah lamented the wickedness of his people and admonished them to live upright lives.

Five hundred years before Christ, Buddha placed personal character foremost and advocated several paths by which a noble character could be obtained; among these are: "Right views, right intentions, right speech, right action, right effort, and right mindfulness."

In the same century Confucius summed up the ten commandments into one basic principle when he said, "Do not do unto others what you would not want them to do to you." Five hundred years later Jesus expressed the same thought in "The Golden Rule." However, He thought the ten commandments incomplete and added, "Thou shalt not be deceitful."

Philologists have long labored in the translation of early literatures. It is often impossible to exactly transfer a thought from one language to another. The numerous translations and versions of the Bible are evidences of this inability. I wish now to call your attention to

a section of Paul's first letter to the Corinthians. As I read it I want you to follow me, bearing in mind this difficulty in early translations. In this section a certain word is translated by some as "Charity," by some as "Love," and by others as "Kindness." Whenever the word "charity" appears in the reading, will you mentally insert in its place the phrase, "universal love for one's fellow-men and gentleness to all"? You will then get its correct interpretation.

> Though I speak with the tongues of men and of angels, and have not charity, I am becoming as sounding brass, or a tinkling cymbal.
>
> And though I have the gift of prophecy, and understand all mysteries, and all knowledge; and though I have all faith, so I could remove mountains, and have not charity, I am nothing.
>
> And though I bestow all my goods to feed the poor, and though I give my body to be burned, and have not charity, it profit eth me nothing.
>
> Charity suffereth long, and is kind; charity envieth not; charity vaunteth not itself, is not puffed up,
>
> Doth not behave itself unseemly, seeketh not her own, is not easily provoked, thinketh no evil;
>
> Rejoiceth not in iniquity, but rejoiceth in the truth;
>
> Beareth all things, believeth all things, hopeth all things, endureth all things.
>
> Charity never faileth; but whether there be prophecies, they shall fail; whether there be tongues, they shall cease; whether there be knowledge, it shall vanish away.

* * *

And now abideth faith, hope, charity, these three; but the greatest of these is charity.

What more concise statement could be made? Without a universal love for one's fellow-men one has not the first rudiment of a successful life. We need again to remember that there is only ONE human race. Countless peoples and countless so-called "races" intermixed for millions of years and preceded the present peoples. Bone for bone, muscle for muscle, nerve for nerve, yes—feeling for feeling—the Negro, the Jap, the Hebrew, the Yankee, the Democrat, and the Republican are identical. A sincere smile needs no translation; it is the same in all languages.

By Nature men have been created for one another's sakes, each to help according to his own ability. Men share a common spirit and common impulses. Call it "charity" or "kindness" or what you will, it is invincible if it is honest and not fawning nor insincere. Some plants offer nectar that they may attract insects and trap them to their death. But in the higher human plane mutual attraction asserts itself, an attraction not present in plants and stones. He who is loyal to his own indwelling God and a possessor of inward grace keeps himself simple, good, sincere, grave, considerate, a friend of justice, and affectionate in duty.

The underlying secret of an attractive personality is to like people. If you try to be nice to people just so that they will like you they will see through your veneer and call you "hollow." It is not enough to try to make them think you like them. Your liking for them must be sincere. Like everybody at first, though you may need to change your opinion of a comparative few of them later.

Outward Show vs. Inward Heart

Man spends considerable time in outward embellishment. He is particular regarding his outward appearances. He seeks to impress others with his standing, dignity and position in life. He buys a more expensive motor car than he should. He would have others look UP to him and he seeks to accomplish this satisfaction of his ego by impressive possessions and properties. He spends too much of his energy and life creating *impressions* instead of creating *friends*. He concerns himself unwisely with his outward trimmings when he should be considering his inward self.

There are certain elements of character which are everywhere welcome. Their power is incessant and they cannot be concealed. If a person has them he is sought by all, though he is without personal beauty, wealth, or genius. And these elements of character can be inspired only by a good heart. No outward sham or pretense can supply them.

Science has taught us that this is a universe of cause and effect. Man has learned to weigh the sun, the earth, and other planets. He is able to accurately calculate their respective causes and effects. He can forecast the location of the shadow of the next solar eclipse and time it to the fraction of a minute.

The ignorant man is superstitious. He believes in luck. The strong man, however, believes in cause and effect, and places his faith in the rule, "As we are, so do we do; and as we do, so is it done to us in turn." We are the builders of our own fortunes and positions of life.

Men talk as if there were some magic about a successful life. There is no such magic—it is very simple; so simple that it is usually overlooked. We have for long believed that man is punished for his sins. One of our earliest and most accepted beliefs is that for every injustice done we sooner or later get paid for it. In this we all admit that we somehow or other get what is coming to us.

Why do we not apply the same logic to the good side of our characters? If we cannot escape punishment for our wrong deeds then we cannot escape reward for our good deeds. You cannot hide your character. It cannot be kept from those you meet. A man cannot utter three sentences without disclosing to intelligent humans precisely where he stands in life and thought.

The word "personality" is derived from the Greek "persona," being a mask worn by players in drama or comedy. And most of us have felt that if we put on the right "mask," or in other words, if we put on the proper "front" our success is assured. That is not so. True human per-

sonality exudes from the heart within. No amount of sham or front can long hide the inward soul; the individual who is thus bluffing his way through life sooner or later takes a fall.

One needs only to transfer his emphasis from the externals and outward embellishments of life, and place it in his inward self. If his heart and character be right, he cannot escape the just reward of an ever widening circle of appreciative friends, which means, if he is an optometrist, an ever growing practice.

A Good Character at Work

We said that the first Primal Law of mankind was to get and to hold. It is true today. The first desire of all those with whom we come in contact is self-preservation and self-interest. In a profession we meet and serve countless members of the human race. They have their selfish desires, just as we do.

From the first moment they meet us they begin to formulate a judgment. They may revise the opinion a bit later, but their opinions are formed largely by the first contacts with us. If from the appearance of our office or the way we work, speak, or look, they get the impression that we are sincerely desirous of serving their welfare, or, in other words, helping them in their efforts at conserving their own interests, they become and remain good patients. But if they get the impression that we are first of all concerned with OUR welfare and place it subordinate to theirs, they react against you.

Though you may be physically unattractive and possessed of only a mediocre mentality, if you possess in your heart the simple basic virtues every one who meets you will become your friend. They will see in you a desire to help them, to cooperate with them in their problems, to find out their likes, and to protect their interests. Let us take up a few of these basic virtues.

If you are sincerely *cheerful* you will bring cheer to those who come in contact with you. If you are *modest*, the other will observe that you are not trying to put yourself upon a higher pedestal than that upon which he places himself. And if you are *energetic* you will be appreciated for no one loves a lazy loafer.

Your *unselfishness* is evidence that you will not take advantage of his friendship. In your *honesty and truthfulness* he enjoys a feeling of security, for he finds that he need not be on his guard but may relax and be contented in your presence. And your *tactfulness* is evidence that you protect, not only his health and pocketbook, but also his personal feelings.

Each one of us, every professional man in fact, has thousands of people in his immediate area. If you are going to get along well with them and be the successful practitioner you have a right to become, it is essential that they not only be able to "get along" with you—they must LIKE you. And it is entirely within your power whether you make of yourself the sort of individual which people will like from the start, will

tell others about, and to whom they will refer an increasing number of their friends.

It is from your actions, motives, and interests that people judge the kind of man you are. From these they decide whether they shall like or dislike you. You can no more hide your character than you can hide a wart on your nose. Your very posture, expressions, voice, gait, and the movements of your hands and eyes will label you plainly.

We grant that clothing and appearances should be kept at an acceptable minimum, but even these are less important than most persons believe. The changing expressions of your countenance disclose clearly what is going on inside of you and they reveal to others your inward attitudes. The key, then, to being liked is to have the right motives in your heart.

Truth and sincerity speak for themselves. Your character is written on your forehead; it rings in the voice; it looks out of your eyes. Love mankind; let your brightness be that of simplicity and self-respect. Live as if on a mountain top and as if each day were to be your last. Act no part nor insincerity. Enter into every man's inner self, and let every other man enter into yours.

In closing may I bring you this thought from the writings of Marcus Aurelius Antonintus, a bit of philosophy penned about the year 150 A. D.: "All of the good things which you pray sooner or later to attain may be yours at once, if only you will not stand in your own way. If only, leaving the past alone and committing the future to the hand of Providence, you will direct the present, and that only, in the way of Holiness and Justice—of Holiness that you may be happy in your apportioned lot—of Justice that you may live without subterfuge, speak the truth, follow law, knowing no injury to another, nor falseness within."

A lovable character and personality is like a fragrant flower, so redolent that everyone who draws near perceives its fragrance.

DR. LAURENCE P. FOLSOM
SOUTH ROYALTON, VERMONT

BOOK NOTICES

THE OCULAR FUNDUS IN DIAGNOSIS AND TREATMENT. Donald T. Atkinson, M.D., F.A.C.S. Published by Lea & Febiger. Washington Square, Philadelphia, Pa. 259 pages, illustrated with 106 engravings, including 58 colored plates. Cloth. $10. 1937.

Here is a new book on ophthalmoscopy. The author outlines in very great detail the characteristics of the ocular fundus and reviews from a diagnostic standpoint the practical application in both health and disease of these ophthalmoscopic appearances. Each ocular and systemic disease having a peculiar fundus characteristic is described. The general and ocular symptoms are given, the exact fundus picture is reviewed and the prognosis and treatment then follow. The text is well illustrated, the colored plates in this volume being unique inasmuch as they are the work of the author himself. These plates are very well done and each is accompanied by descriptive matter presenting the clinical findings and the laboratory reports that have a direct bearing on the condition illustrated. The work is comprehensive and well organized and will be a distinct aid to the optometrist in making his ophthalmoscopic examinations. C. C. K.

* * * * *

LECTURES DELIVERED AT THE DETROIT CONGRESS OF THE AMERICAN OPTOMETRIC ASSOCIATION, 1936. Edited by E. Kiekenapp, Opt.D., F.A.A.O. Published by the Journal of the American Optometric Association. 404 Wilmac Building, Minneapolis, Minn. 127 pages. Illustrated. Cloth $2.50. 1937.

Here is a little volume which should enjoy wide distribution. Certainly those optometrists who attended the Congress and heard these speakers will want a copy and for those who missed this event the book will give them an opportunity to offset this loss of last summer, as all of the material presented before the delegates is included. Among the important contributions presented here is a paper on Motor Vision by Lauer. This is very well written and fully covers the years of research work done in the field of survey work on the drivers of motor cars. Louis Jaques presents some additional work he has been doing in the field of reciprocal innervation, while Ewing Adams and Ray Morse-Peckham present reports of the splendid work being accomplished at the Optometric Research Institute of Michigan. The book closes with three short essays on Syntonics by H. Riley Spitler. The American Optometric Association is doing a good piece of work in having these papers published, but to have this work continued, these books must be

sold. Optometrists are urged to support this activity so it will be continued in the future. The cost of the book is small and after thumbing through it the reader will feel well repaid for his investment.

C. C. K.

* * * * *

ABSTRACTS

APPARENT INCREASE OF HYPEROPIA UP TO THE AGE OF NINE YEARS. Brown, E. V. L. American Journal of Ophthalmology, December, 1936.

This paper is of special interest due to the fact that it advances an hypothesis which challenges the accepted statement that all children are born hyperopic and that the amount of hyperopia decreases during the school years.

In support of his statement, Brown offers the following findings from an examination of 604 eyes of children under nine years of age, whom he refracted under cycloplegia upon two or more periods.

The data reveals that 63 per cent of the eyes became more hyperopic. In 8 per cent there was no change and 29 per cent showed a decrease in the amount of hyperopia.

Analyzing the findings of the phorias it was revealed that 445 or 74 per cent of the cases had varying degrees of strabismus. The hyperopic findings were as follows:

	Increase	Decrease	Stationary
159 non-strabismic eyes.....	47%	42%	11%
445 strabismic eyes.....	69%	24%	7%

Brown contends that the figures he obtained present a real challenge to the theory that all eyes become less hyperopic during the early years of life. Brown's findings are in direct contrast to Sursby's experimental findings which covered many thousands of cases which were kept under observation for a number of years. Sursby and a group of his colleagues in studying the causes of school of myopia in London schools have over a period of years examined many thousands of children and they found that the amount of hyperopia decreased during the school life. The discrepancy in the findings of these investigators may be attributed to the fact that Brown's investigation was limited to only 604 eyes and it also covered only a short span of the child's school life. The problem is indeed of great interest and deserves further study and investigation.

J. I. K.

EDITORIAL NOTICE TO CONTRIBUTORS

The American Journal of Optometry is a monthly journal, published in annual volumes of about five hundred pages of reading matter each, illustrated where necessary, by cuts in the text.

About four-fifths of the space is devoted to original papers, and the remaining fifth is given over to technical editorials, abstracts and book reviews, *all of them original.*

The papers and reports are original and are accepted only with the understanding that they are to be published in this journal exclusively.

The editors and publishers of the American Journal of Optometry beg to offer the following suggestions to authors who propose to favor them with the publication of their contributions.

I. Write on one side of the paper. Double-spaced, typewritten MS. is preferred.

II. Words to be printed in *italics* should be underscored once, in SMALL CAPS twice, and in LARGE CAPITALS three times. **Antique type** when called for should be so marked.

III. Be sure that the title of your paper indicates its contents. Should the subject be a general one, for instance, Case Reports, it would be well to mention the subject of each special report,—for instance: Case One. Progressive Myopia with Exophoria. Case 2. Divergence Squint with Amblyopia. These special titles will appear in the table of contents of each number.

IV. Illustrations should be carefully drawn on separate sheets.

V. When authors receive proofs for revision, they should correct and return these without delay. We beg, however, to remind our contributors that changes in the manuscript necessitates resetting, this causing much additional expense, so we ask that alterations be limited to what is of essential importance.

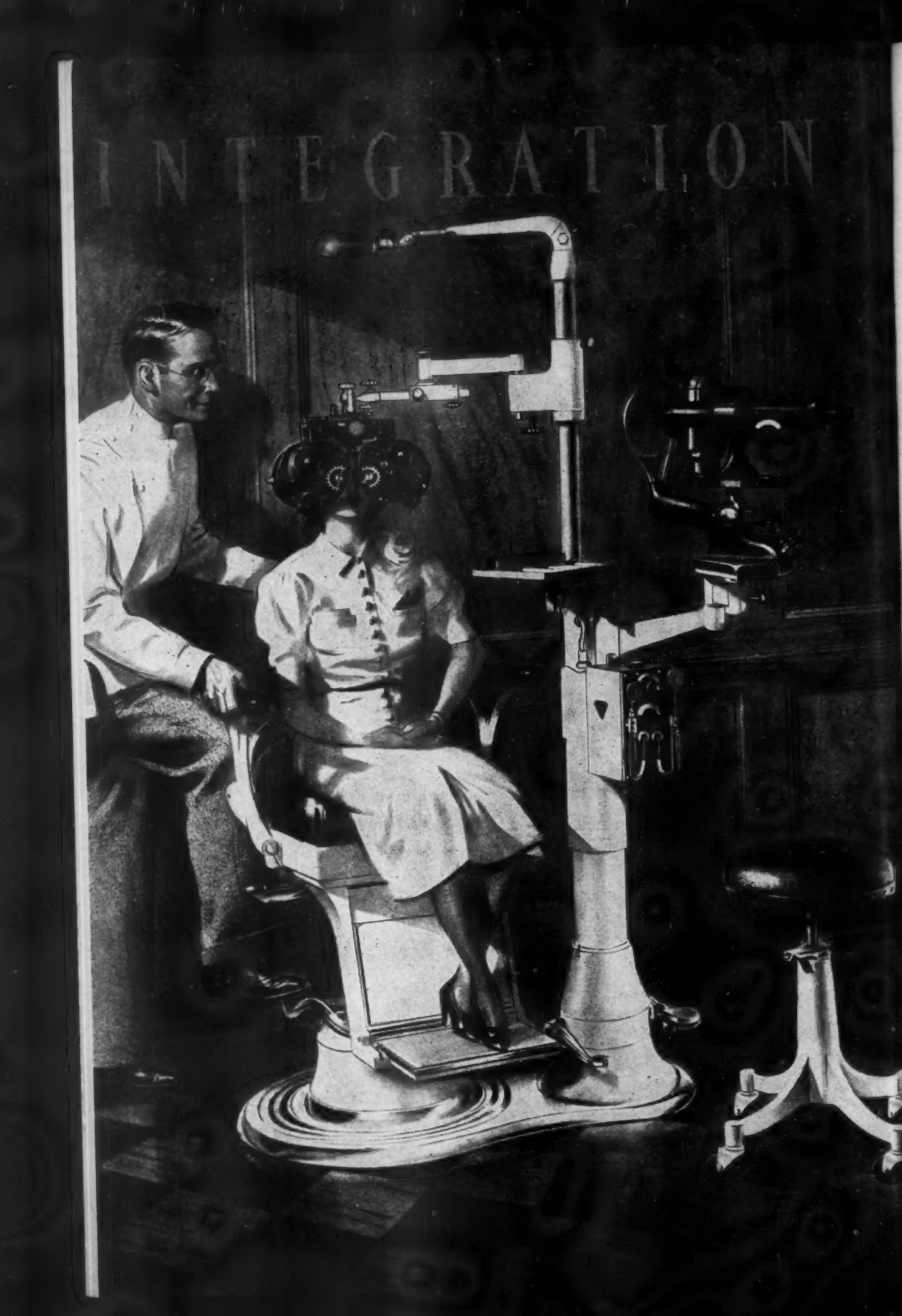
VI. Because of the added cost, we have discontinued the giving of gratuitous reprints to our authors, but we will supply them with these at the cost of press work and paper where so desired. The following tables of charges will apply for the year 1937.

Number of Reprints	Number of Pages in Reprint						
	2	4	8*	12*	16*	20*	24*
50	$3.00	$4.00	$9.00	$10.50	$11.50	$13.50	$17.50
100	3.50	4.50	9.75	12.25	14.25	16.50	18.75
250	5.75	7.50	15.75	18.50	20.25	24.25	28.50
500	9.50	12.50	27.00	28.50	33.50	40.00	45.50

*Reprints with 8 or more pages are furnished with heavy paper covers on which is printed the title of the paper and the author's name.

Prices for greater numbers furnished on request. Orders for reprints should be placed at the head of the manuscript, or should at the latest reach us before the Journal has gone to press.

When sending manuscripts to the American Journal of Optometry, please address the editor: Dr. Carel C. Koch, 1501-1504 Foshay Tower. Minneapolis, Minn.


INTEGRATION

"To Greater Vision . . ."

YEAR after year men of science have striven to perfect examination of the eye, that greater precision in diagnosis might be attained. And, throughout those same years, has proceeded the parallel search for lenses which would yield in daily use the precision achieved by professional examination. Without precision in diagnosis the prescription would be incorrect; lacking precise interpretation of the prescription, the lenses would fall short of their purpose.

The vital necessity of integrating diagnostic findings with the patient's lenses is a constant care at Bausch & Lomb. Each advance in lens precision has been followed by corresponding betterment of diagnostic equipment. Each new problem revealed by improved diagnosis has been seconded by greater refinement in lenses. To you this means a higher standard of service to patients, greater prestige and emolument, by standardizing on Bausch & Lomb.

BAUSCH & LOMB

OPTICAL COMPANY , , ROCHESTER, N. Y.

Welcome your Bausch & Lomb Distributor's Representative—Ambassador of Growth

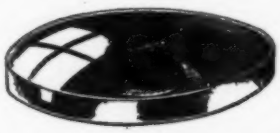
TITMUS

PERFEX LENSES

FAMOUS THROUGHOUT THE PROFESSION FOR

QUALITY

From every branch of the Profession comes commendation of the uniform quality and precision of Titmus ophthalmic lenses. Doctor, fitter and optical technician share with the patient the fruits of manufacturing care and accuracy.



The Titmus Optical Company, Inc.

Independent Manufacturers of Perfect Quality Ophthalmic Lenses

PETERSBURG, VIRGINIA, U. S. A.

Satisfaction Beyond Expectation!

WALMAN

SYMMETRO-PRISM

BIFOCAL SERVICE

THE WALMAN OPTICAL COMPANY

MINNEAPOLIS

ST. PAUL GRAND FORKS FARGO

"THE OLD FORD'LL MAKE IT . .

and the cows will get their milkin' on time"

Three o'clock—the busiest hour of a busy day in January. In the door came a man and woman, who seeing the hustle and bustle, looked apprehensively at each other and whispered for a moment. He nervously adjusted the collar of his faded brown shirt. She looked at her worn "Sunday dress" and coat. Then taking a deep breath to gain courage he walked up to the manager and handed him an envelope. . . . "Dr. 'E' down on Main Street said t' bring this in to you folks," he said nervously, "and t' tell you we was in a hurry."

The manager took the envelope on which was written, "Frank: This man must get home early to milk, so to save time I'm sending him right to you for his glasses." Frank looked around him helplessly and opened the envelope. The prescription was for Orthogon "D" bifocals for the man's wife, Mrs. "W."

"We live in Harrisonville," Mr. "W" said earnestly, "an' we don't like t' drive after dark. The Ford's gettin' kinda old."

"I'll get them started for you right away and we'll have them out as quickly as we can," the Riggs man promised as he showed them where to sit.

At four forty-five he was back, asking Mrs. "W" to step up for fitting. Five minutes later they went out the door, smiling. "The old Ford'll make it," the man told his wife, "and the cows'll get their milkin' on time."

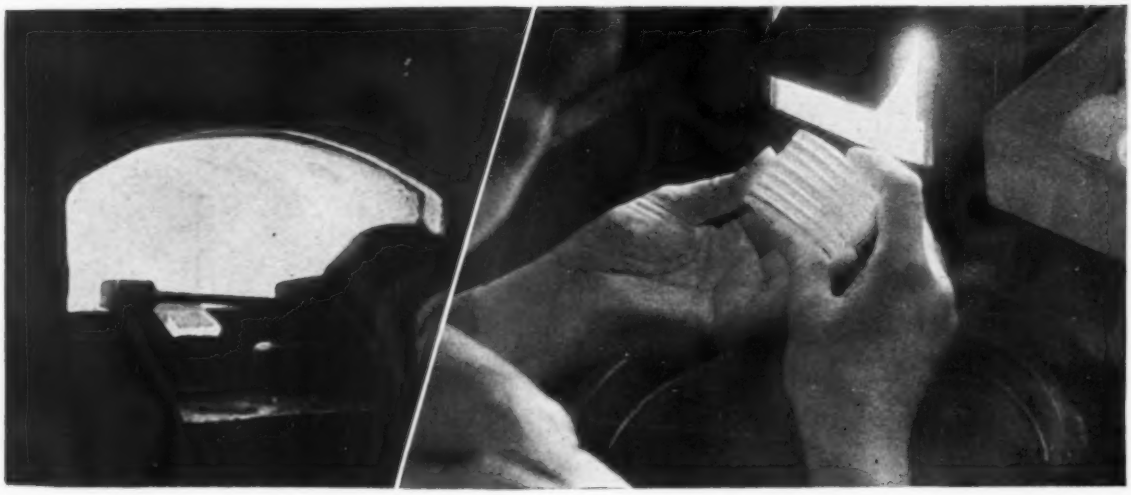
★

To give the most efficient service possible—that is the creed of every Riggs office. It took some stepping to manufacture that Rx in such a short time for farmer "W's" wife but it was urgent and fortunately there were no unlucky "breaks." When you send your prescriptions to a Riggs office you can depend upon ROCO Service to go the limit (within reason, of course) in helping you serve your customers.

RIGGS OPTICAL COMPANY

MOULDING LENS BLANKS

INSPECTING LENS BLANKS



SKILLED HANDS

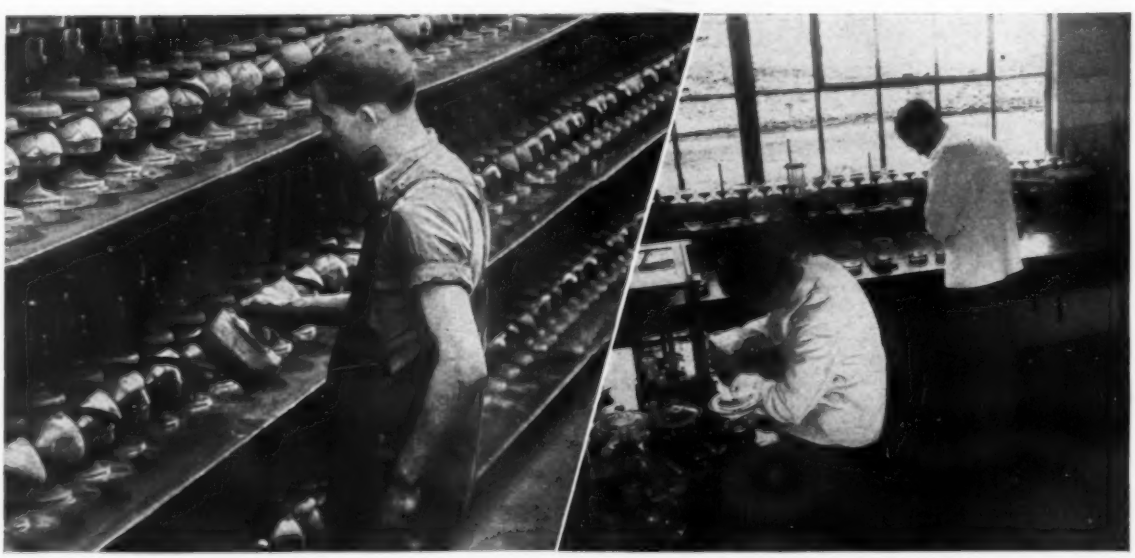
IN the experienced hands of those who work with Shuron lenses rests that extra measure of quality which is an integral part of every lens that leaves the Shuron plant.

Working on precision manufacture or checking the product by inspection and laboratory control throughout, these skilled hands maintain "Quality Beyond Question" for Widesite, Rontor and Shuron single vision and multi-vision lenses. Compare these Shuron lenses with others — for proof of Shuron lens superiority.

SHURON OPTICAL COMPANY, INC.

"THE HOUSE OF PROGRESS" SINCE 1864

GENEVA, NEW YORK



LENS GRINDING

LABORATORY CONTROL